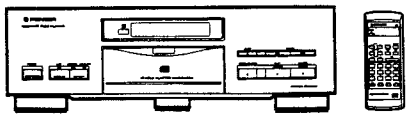
PIONEER®
The Art of Entertainment

Service Manual



ORDER NO.
ARP2297

COMPACT DISC PLAYER

PD-41
PD-9700

PD-41 AND PD-9700 HAVE THE FOLLOWING :

Type	Model		Power Requirement	Remarks
	PD-41	PD-9700		
KU	○	–	AC 120 V only	
KC	–	○	AC 120 V only	
HEM	–	○	AC 220 V-230 V, AC 230 V-240 V(switchable)*	
HB	–	○	AC 220 V-230 V, AC 230 V-240 V(switchable)*	
SD	–	○	AC 110 V, 120 V-127 V, 220 V, 240 V(switchable)	

* Change the connection of the power transformer's primary wiring.

- **This manual is applicable to PD-41/KU, PD-9700/KC, HEM, HB and SD types.**
- **As to the PD-9700/KC, HEM, HB and SD types, refer to page 84.**
- **As to the disassembly and mechanism descriptions, refer to the PD-41, PD-9700 service guide(ARP2318).**
- **Ce manuel pour le service comprend les explications de réglage en français.**
- **Este manual de servicio trata del método ajuste escrito en español.**

CONTENTS

1. SAFETY INFORMATION 2
2. EXPLODED VIEWS AND PARTS LIST 4
3. PACKING 11
4. SCHEMATIC DIAGRAM AND P.C.BOARDS CONNECTION DIAGRAM 12
5. P.C.B's PARTS LIST 32
6. ADJUSTMENTS 35
6. RÉGLAGE 50
6. AJUSTE 66
7. IC INFORMATION 82
8. FOR PD-9700/KC, HEM, HB AND SD TYPES 84
9. PANEL FACILITIES 86
10. SPECIFICATIONS 88

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS SERVICE INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.
PIONEER ELECTRONICS OF CANADA, INC. 505 Cochrane Drive, Markham, Ontario L3R 8E3 Canada
PIONEER ELECTRONIC [EUROPE] N.V. Keetberglaan 1, 9120 Beveren, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: [03] 580-9911

© PIONEER ELECTRONIC CORPORATION 1991

FI JUNE 1991 Printed in Japan

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING
Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).
When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

1. SAFETY INFORMATION

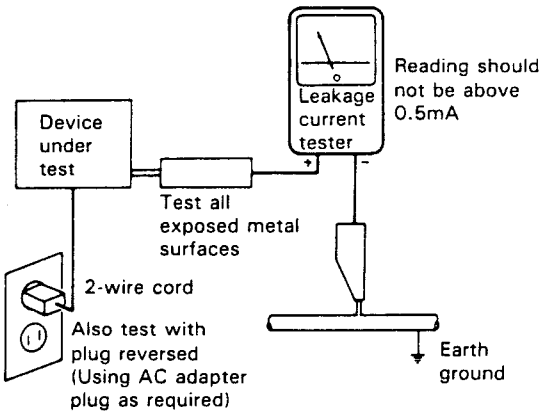
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.


Leakage current tester
Reading should not be above 0.5mA
Device under test
Test all exposed metal surfaces
2-wire cord
Also test with plug reversed (Using AC adapter plug as required)
Earth ground

AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.
The use of a substitute replacement component which dose not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

(FOR EUROPEAN MODEL ONLY)

VARO!
AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.

ADVERSEL:
USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION UNDGÅ UDSAETTELSE FOR STRÅLING.

VARNING!
OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.

LASER
Kuva 1
Lasersateilyn
varoitusmerkki

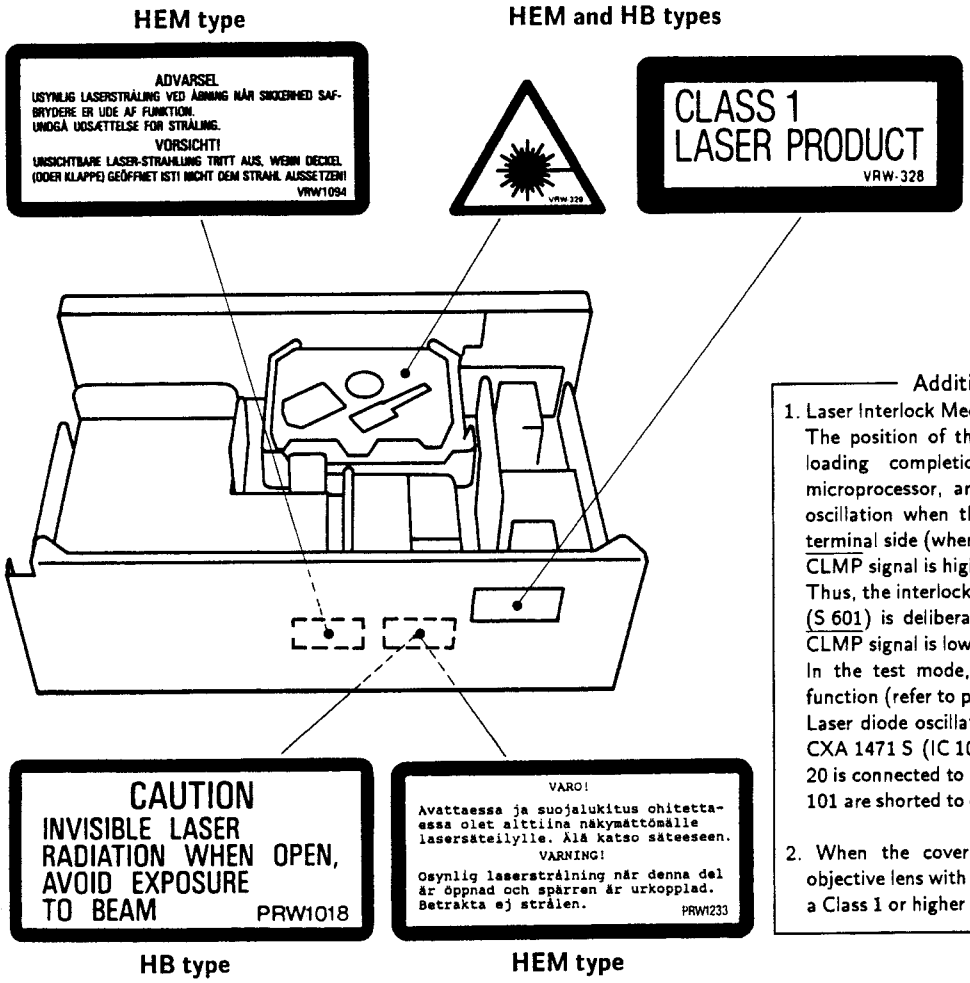
WARNING!
DEVICE INCLUDES LASER DIODE WHICH EMITS INVISIBLE INFRARED RADIATION WHICH IS DANGEROUS TO EYES. THERE IS A WARNING SIGN ACCORDING TO PICTURE 1 INSIDE THE DEVICE CLOSE TO THE LASER DIODE.

IMPORTANT
THIS PIONEER APPARATUS CONTAINS LASER OF HIGHER CLASS THAN 1. SERVICING OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUCTED PERSON.

LASER DIODE CHARACTERISTICS
MAXIMUM OUTPUT POWER: 5 mw
WAVELENGTH: 780-785 nm

LASER
Picture 1
Warning sign for
laser radiation

LABEL CHECK



Additional Laser Caution

1. Laser Interlock Mechanism
   The position of the switch (S 601) for the detecting loading completion is detected by the system microprocessor, and the design prevents laser diode oscillation when the switch (S 601) is not in $\overline{\text{CLMP}}$ terminal side (when the mechanism is not clamped and $\overline{\text{CLMP}}$ signal is high level).
   Thus, the interlock will no longer function if the switch (S 601) is deliberately set to $\overline{\text{CLMP}}$ terminal side (if $\overline{\text{CLMP}}$ signal is low level).
   In the test mode, the interlock mechanism will not function (refer to page 36).
   Laser diode oscillation will continue if pins 2 and 3 of CXA 1471 S (IC 101) are connected to ground or pin 20 is connected to high level(ON) or the terminals of Q 101 are shorted to each other(fault condition).

2. When the cover is opened, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 or higher laser beam.

2. EXPLODED VIEWS AND PARTS LIST

NOTES :

- *Parts without part number cannot be supplied.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*

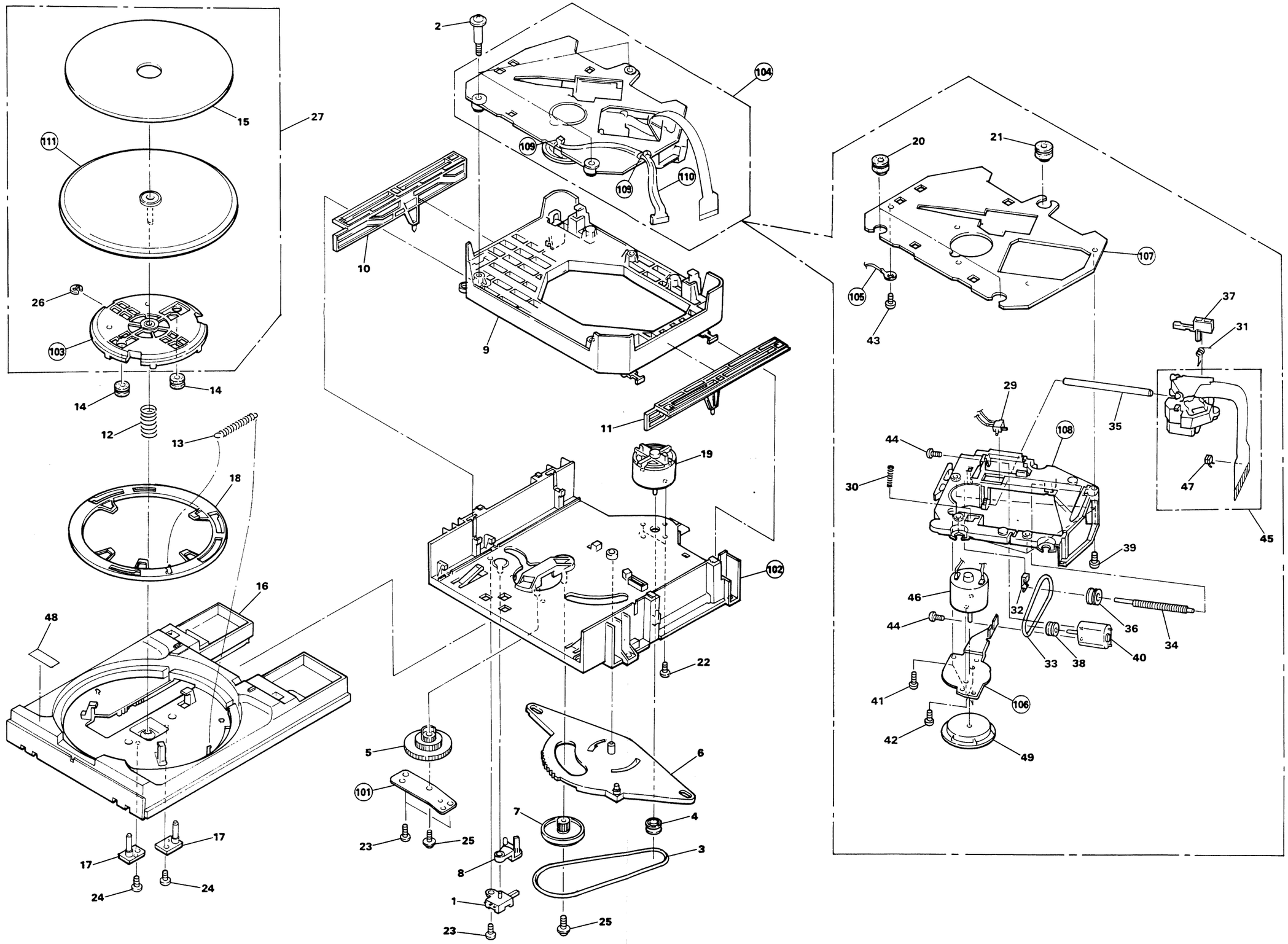
2.1 EXTERIOR

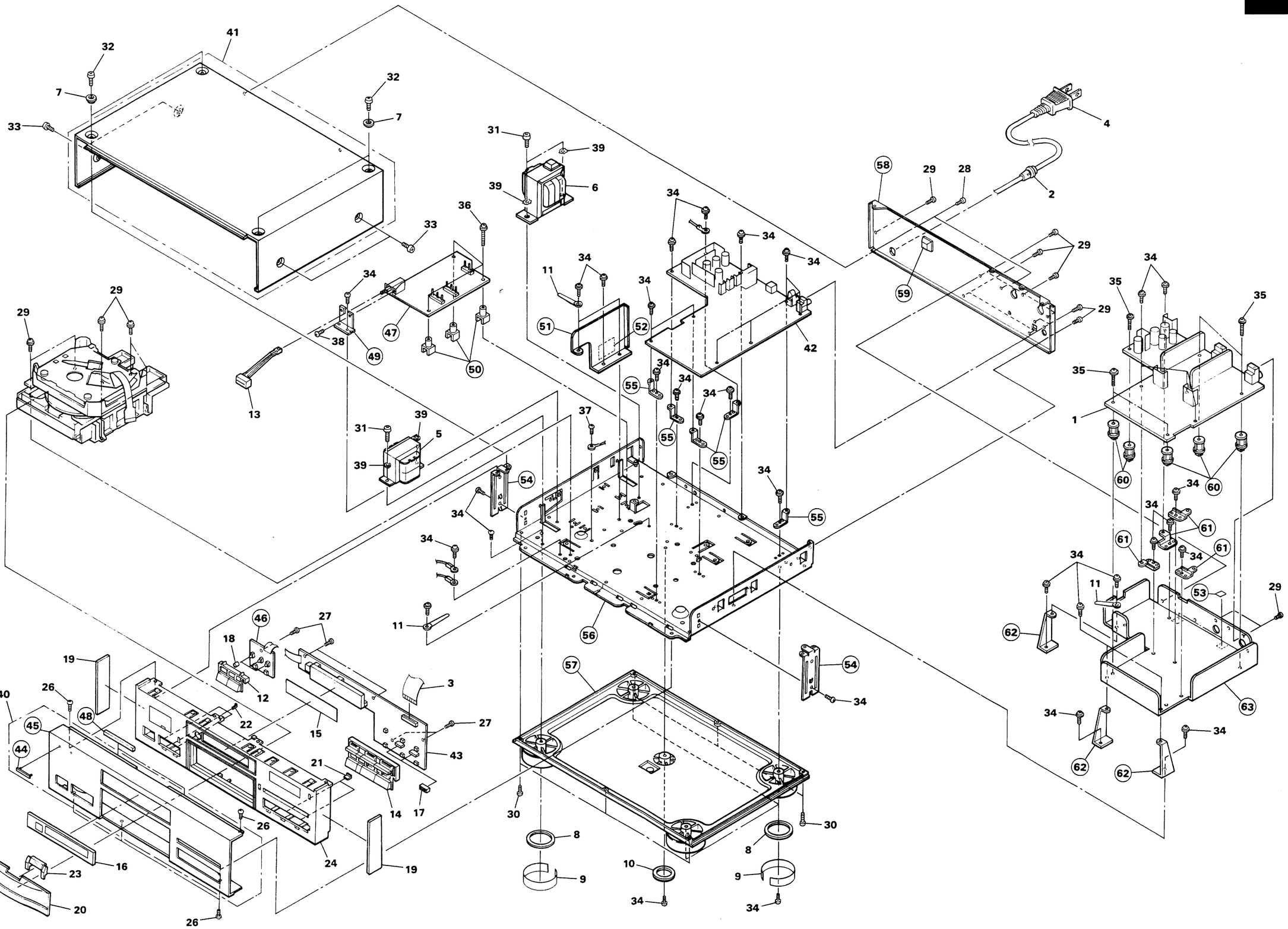
Parts List of Exterior

Mark	No.	Description	Parts No.
⚠◉	1	Analog board assembly	PWM1490
⚠	2	Strain rerief	CM-22C
	3	33P F.F.C/30V	PDD1094
⚠	4	AC power cord	PDG1015
⚠	5	Power transformer	PTT1166
⚠	6	Power transformer	PTT1206
	7	Washer	ABE1009
	8	Stopper	PNM1095
	9	Tape	PNM1099
	10	Stopper	PNM1107
	11	Cord clamper(steel)	RNH-184
	12	Button	PAC1530
	13	Power button	PAC1539
	14	Control button	PAC1609
	15	FL sheet	PAM1514
	16	Display window	PAM1515
	17	LED cover	PEB1150
	18	LED cover (S)	PEB1167
	19	Side rubber	PEB1180
	20	Tray panel	PNW1815
	21	Lens L	PNW1860
	22	Indicator lens	PNW1893
	23	Tray lens	PNW1950
	24	Control panel	PNW2066
	25	. . . . .	
	26	Screw	BBT30P080FCC
	27	Screw	BBZ26P080FCC
	28	Screw	BBZ30P080FCC
	29	Screw	BBZ30P080FCC
	30	Screw	BBZ30P140FCC
	31	Screw	BBZ40P060FCC
	32	Screw	BBZ40P080FZK
	33	Screw	FBT40P080FZK
	34	Screw	IBZ30P060FCC
	35	Screw	IBZ30P150FCC
	36	Screw	IBZ30P180FCC
	37	Screw	PDZ30P050FCC
	38	Screw	PMZ30P060FCC
	39	Washer	WH40FUC
	40	Front panel assembly	PEA1167

Mark	No.	Description	Parts No.
	41	Bonnet case	PYY1071
⚠◉	42	Main board assembly	PWZ2150
◉	43	Function A board assembly	PWZ2168
	44	Badge	
	45	Front panel	
	46	Function B board assembly	
	47	Primary board assembly	
	48	Rubber sheet	
	49	Switch angle	
	50	Spacer	
	51	L angle	
	52	Sheet	
	53	Tape	
	54	Side angle	
	55	PCB angle	
	56	Under base	
	57	Base	
	58	Rear base	
	59	Binder holder	
	60	PCB spacer	
	61	Angle B	
	62	Shield angle	
	63	Shield plate	

2.2 MECHANISM SECTION




41
32
7
33
32
7
31
39
39
6
36
33
34
11
34
51
34
52
34
34
42
58
29
28
2
4
29
59
29
34
35
35
29
35
1
60
60
34
61
61
61
34
34
11
53
29
62
63
34
62
62
34
29
29
34
38
49
47
50
13
31
39
5
39
37
54
34
34
55
34
34
55
55
34
55
56
54
34
57
30
8
9
10
34
8
9
30
34
46
27
18
19
12
3
40
26
22
15
27
45
48
43
44
21
14
17
26
24
16
23
19
20
26

Parts List of Mechanism section

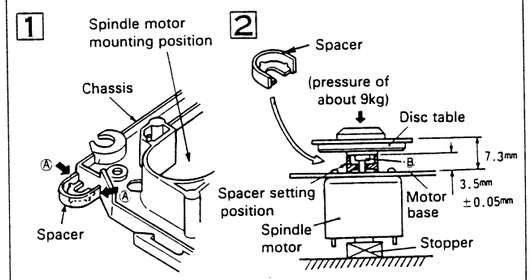
Mark	No.	Description	Parts No.
	1	Lever switch	DSK1003
	2	Screw(steel)	PBA1027
	3	Rubber belt	PEB1186
	4	Motor pulley	PNW1634
	5	Drive gear	PNW1996
	6	Timing lever	PNW1997
	7	Gear pulley	PNW1998
	8	SW head	PNW1999
	9	Float base	PNW2000
	10	Left cam	PNW2001
	11	Right cam	PNW2002
	12	Compression spring	PBH1120
	13	Tention spring	PBH1121
	14	Float(rubber)	PEB1014
	15	Table rubber sheet	PEB1169
	16	Tray	PNW2003
	17	Table guide	PNW2004
	18	Lock plate	PNW2005
	19	DC motor(0.75W)	PXM1010
	20	Rubber bush	PEB1031
	21	Rubber bush	PEB1170
	22	Screw	BMZ26P040FMC
	23	Screw	BPZ26P060FMC
	24	Screw	BPZ26P060FMC
	25	Screw	IPZ20P080FMC
	26	Stop ring	YE20S
	27	Turn table assembly	PEA1157
	29	Push switch	DSG1014
	30	Spring	PBH1009
	31	Speing	PBH1084
	32	Plate spring	PBK1057
	33	Belt(square)	PEB1072
	34	Screw	PLA1003
	35	Guide bar	PLA1071
	36	Pulley	PNW1066
	37	Half nut	PNW1605
	38	Motor pulley	PNW1634
	39	Screw	PBZ30P080FMC
	40	DC motor(1.7W)	PXM1013
	41	Screw	BPZ20P080FZK
	42	Screw	JFZ20P025FMC
	43	Screw	PBZ30P060FMC
	44	Screw	PMZ20P030FMC
	45	Pick up assembly	PEA1030
	46	DC motor assembly(With oil)	PEA1156
	47	Semi-fixed VR(3.3K)	PCP1008
	48	Caution label	PRW1244
	49	Disc table	PNW1067

Mark	No.	Description	Parts No.
	101	Shaft holder	
	102	Loading base	
	103	Table bearings assembly	
	104	Servo mechanism assembly	
	105	Earth lead unit(300V)	
	106	Motor base	
	107	Mechanism base	
	108	Mechanism chassis	
	109	Clamper	
	110	Connector assembly	
	111	Turn table(AL)	

• How to install the disc table

1 Use nippers or other tool to cut the two sections marked Ⓐ in figure 1. Then remove the spacer.

2 While supporting the spindle motor shaft with the stopper, put spacer on top of the motor base (angled so it doesn't touch section Ⓑ), and stick the disc table on top (takes about 9kg pressure). Take off the spacer.



2.3 REMOVE THE TRAY PANEL AND THE TRAY LENS

Hold the tray panel with your hands as the figure shown right, and grasp the tray with your thumbs and then lift the tray panel up while pulling it toward you with the other fingers.(Figs . 1 and 2)

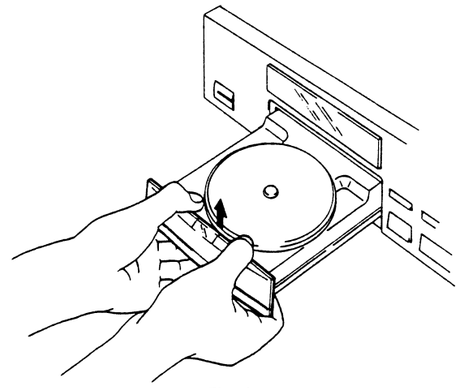


Fig. 1

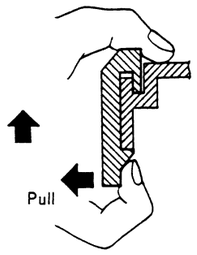


Fig. 2

2.4 INSTALL THE TRAY PANEL AND THE TRAY LENS

Align the tray panel with the grooves located at both edges of the tray while holding the tray lens with you fingers, and then press it down till it stops. (Fig. 3)

Hold the tray panel and the tray as shown in Fig. 4 and slide them down till you hear a click sound while pressing strongly with your thumbs. (Figs. 4 and 5)

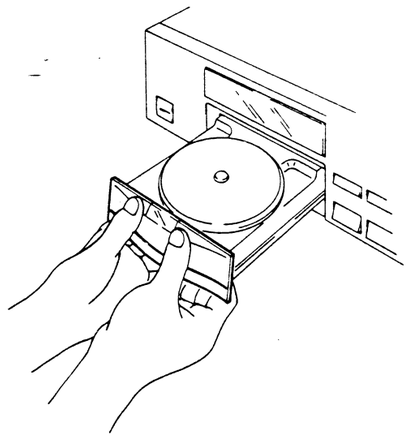


Fig. 4

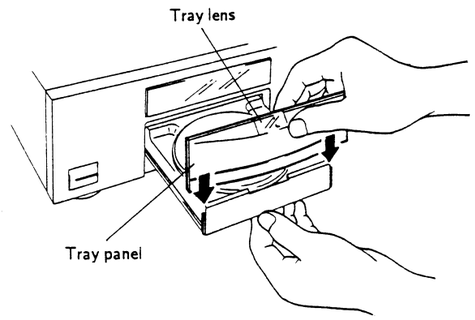


Fig. 3

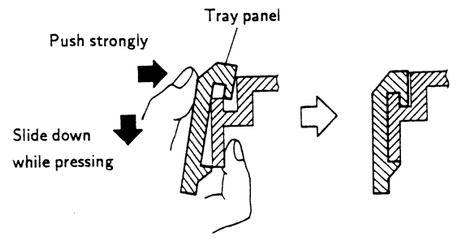


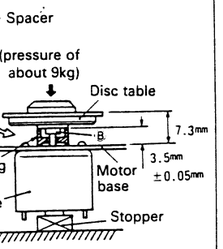
Fig. 5

Parts No.

table

cut the two sections
n remove the spacer.

dle motor shaft with
op of the motor base
section Ⓑ), and stick
about 9kg pressure).



2.3 REMOVE THE TRAY PANEL AND THE TRAY LENS

Hold the tray panel with your hands as the figure shown right, and grasp the tray with your thumbs and then lift the tray panel up while pulling it toward you with the other fingers.(Figs . 1 and 2)

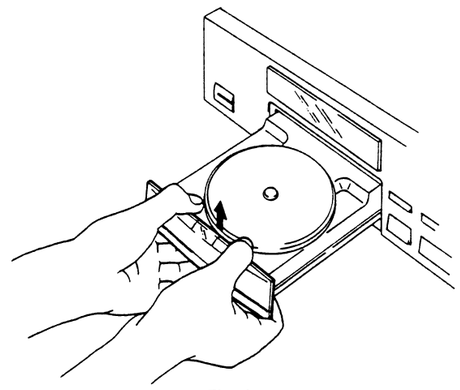


Fig. 1

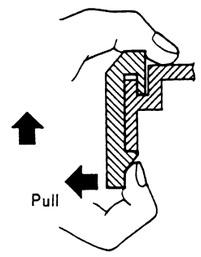


Fig. 2

2.4 INSTALL THE TRAY PANEL AND THE TRAY LENS

Align the tray panel with the grooves located at both edges of the tray while holding the tray lens with you fingers, and then press it down till it stops. (Fig. 3)

Hold the tray panel and the tray as shown in Fig. 4 and slide them down till you hear a click sound while pressing strongly with your thumbs. (Figs. 4 and 5)

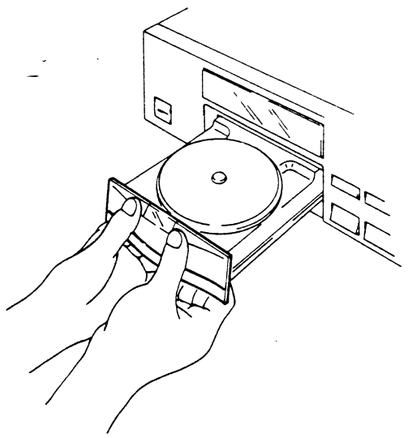


Fig. 4

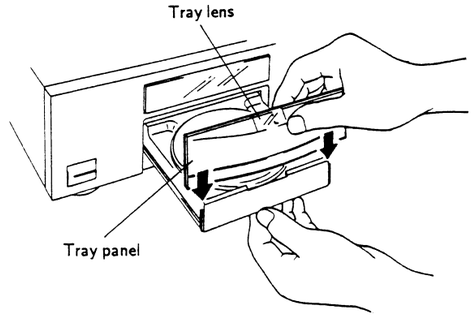


Fig. 3

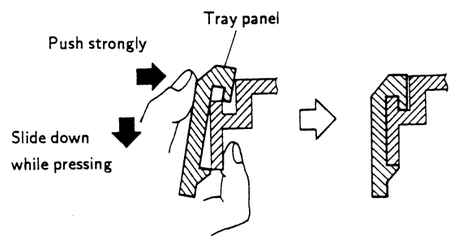
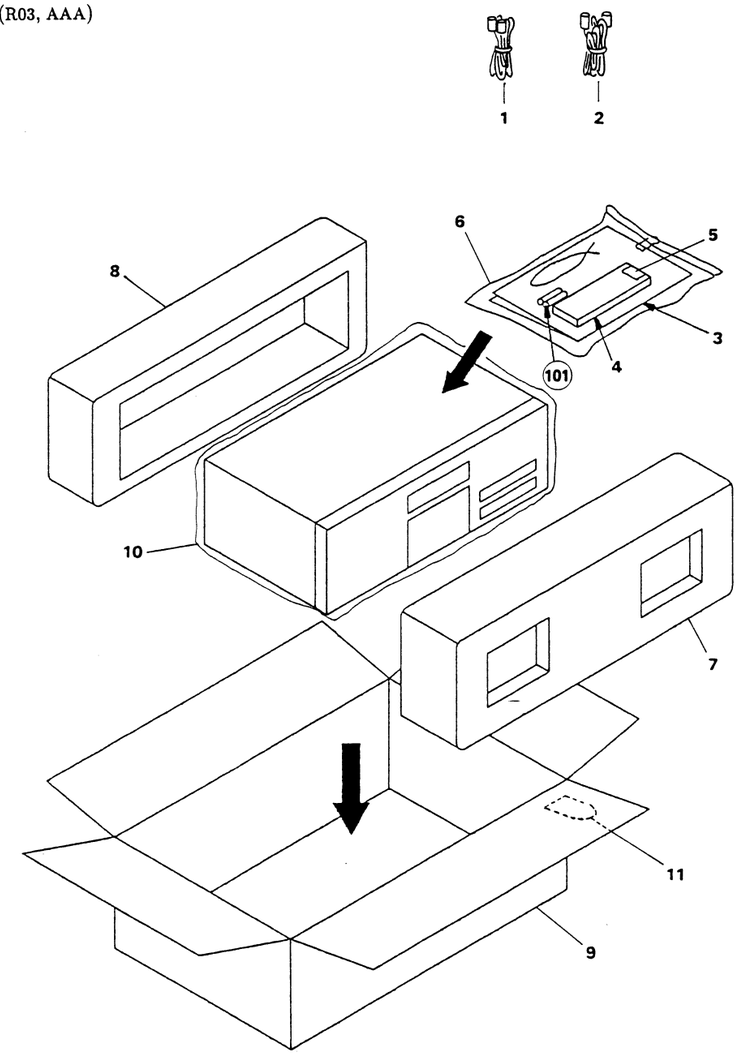


Fig. 5

3. PACKING

Mark	No.	Description	Parts No.
	1	Cord with plug(mini plug)	PDE-319
	2	Cord with plug	PDE1001
	3	Operating instructions (English, French)	PRE1149
	4	Remote control unit(CU-PD054)	PWW1058
	5	Battery cover	PZN1001
	6	Polyethelene bag	Z21-038
	7	Protector F	PHA1145
	8	Protector R	PHA1146
	9	CD packing case	PHG1677
	10	Sheet	VHL-037
	11	Label	PRW1253
	101	Battery (R03, AAA)	



•TERMINAL VOLTAGES

IC101 (CXA1471S)

Pin No.	Voltage	Pin No.	Voltage
1	0	12	0
2	2.9	13	−0.9
3	−4.7	14	−0.7
4	0	15	0
5	0	16	0
6	−5	17	0
7	0	18	0.8
8	0	19	0
9	0	20	5
10	0	21	5
11	0	22	0

IC151 (CXA1372S)

Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	0	17	0	33	5
2	0	18	0	34	0
3	0	19	0	35	0
4	0	20	0.2〜0.8	36	−5
5	0	21	0	37	2.5
6	0	22	−4	38	2.5
7	0	23	1.3	39	5
8	0	24	0	40	−1.5
9	0	25	−5	41	−1.7
10	0	26	5	42	5
11	1	27	5	43	−0.7
12	0	28	5	44	−1.6
13	0.2	29	5	45	0
14	0	30	5	46	0.8
15	0	31	5	47	−5
16	5	32	0	48	0

IC301 (CXD2500AQ)

Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	5	21	0	41	2.5	61	0
2	2.1	22	2.5	42	5	62	2.5
3	5	23	5	43	2.5	63	0
4	2.6	24	2.5	44	0	64	0
5	2.2	25	0.2	45	5	65	0
6	5	26	0	46	4.4	66	3.3〜4.6
7	0	27	2.5	47	0	67	5
8	5	28	0	48	0	68	0
9	0	29	0	49	0 〜0.3	69	2.1〜3
10	0	30	0	50	1.2	70	5
11	2.1	31	1.3〜2.2	51	1.2	71	5
12	0	32	2.5	52	0	72	5
13	1.0	33	5	53	2.5	73	5
14	0.9〜1.3	34	2.5	54	2.5	74	5
15	0	35	2.5	55	0	75	5
16	2.0	36	2.5	56	2.9	76	0
17	0	37	2.5	57	2.5	77	5
18	2.5	38	2.5	58	5	78	5
19	2.4	39	0	59	5	79	5
20	2.4	40	5	60	2.5	80	0

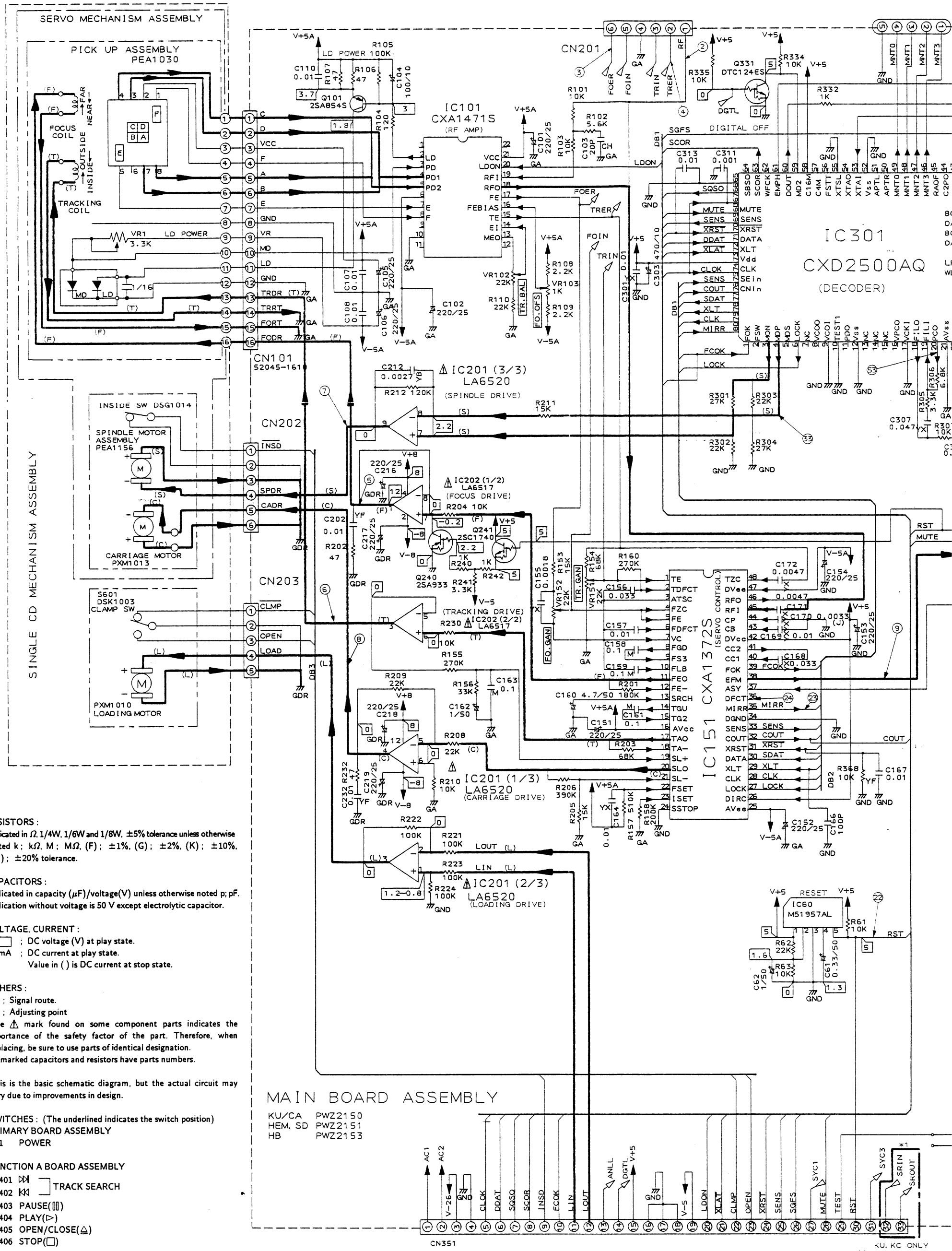
IC401 (PD4329A)

Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	5	17	−1	33	5	49	5
2	−24〜−24.3	18	−2.6	34	3.3〜4.7	50	5
3	−24〜−24.3	19	−5	35	5	51	0
4	−24〜−24.3	20	−17.6〜−17.8	36	0	52	5
5	−24〜−24.3	21	−1.6	37	5	53	5
6	−24〜−24.3	22	−12.5〜−15.5	38	5	54	5
7	−24〜−24.3	23	−3.4 〜−6.4	39	0	55	5
8	−24〜−24.3	24	−4 〜−7	40	0	56	2.5
9	−24〜−24.3	25	−6.8 〜−9.8	41	0	57	2.5
10	−24〜−24.3	26	5	42	0	58	0
11	−24〜−24.3	27	−1.5	43	5	59	0
12	0	28	−1.2 〜−1.6	44	5	60	5
13	5	29	−12.5〜−15.4	45	0	61	0
14	0	30	−12.1〜−17.6	46	5	62	0
15	4.9	31	4	47	5	63	0
16	−27.5〜−27.8	32	5	48	2.1〜3	64	0

PD-41, PD-9700

4. SCHEMATIC DIAGRAM AND P.C.BOARDS CONNECTION DIAGRAM

4.1 MAIN BOARD(PWZ 2150), PRIMARY BOARD, FUNCTION A BOARD(PWZ 2168), AND FUNCTION B BOARD ASSEMBLIES



1.RESISTORS :
Indicated in Ω, 1/4W, 1/6W and 1/8W, ±5% tolerance unless otherwise noted k ; kΩ, M ; MΩ, (F) ; ±1%, (G) ; ±2%, (K) ; ±10%, (M) ; ±20% tolerance.

2.CAPACITORS :
Indicated in capacity (μF)/voltage(V) unless otherwise noted p; pF.
Indication without voltage is 50 V except electrolytic capacitor.

3.VOLTAGE, CURRENT :
▭ ; DC voltage (V) at play state.
⇦mA ; DC current at play state.
Value in ( ) is DC current at stop state.

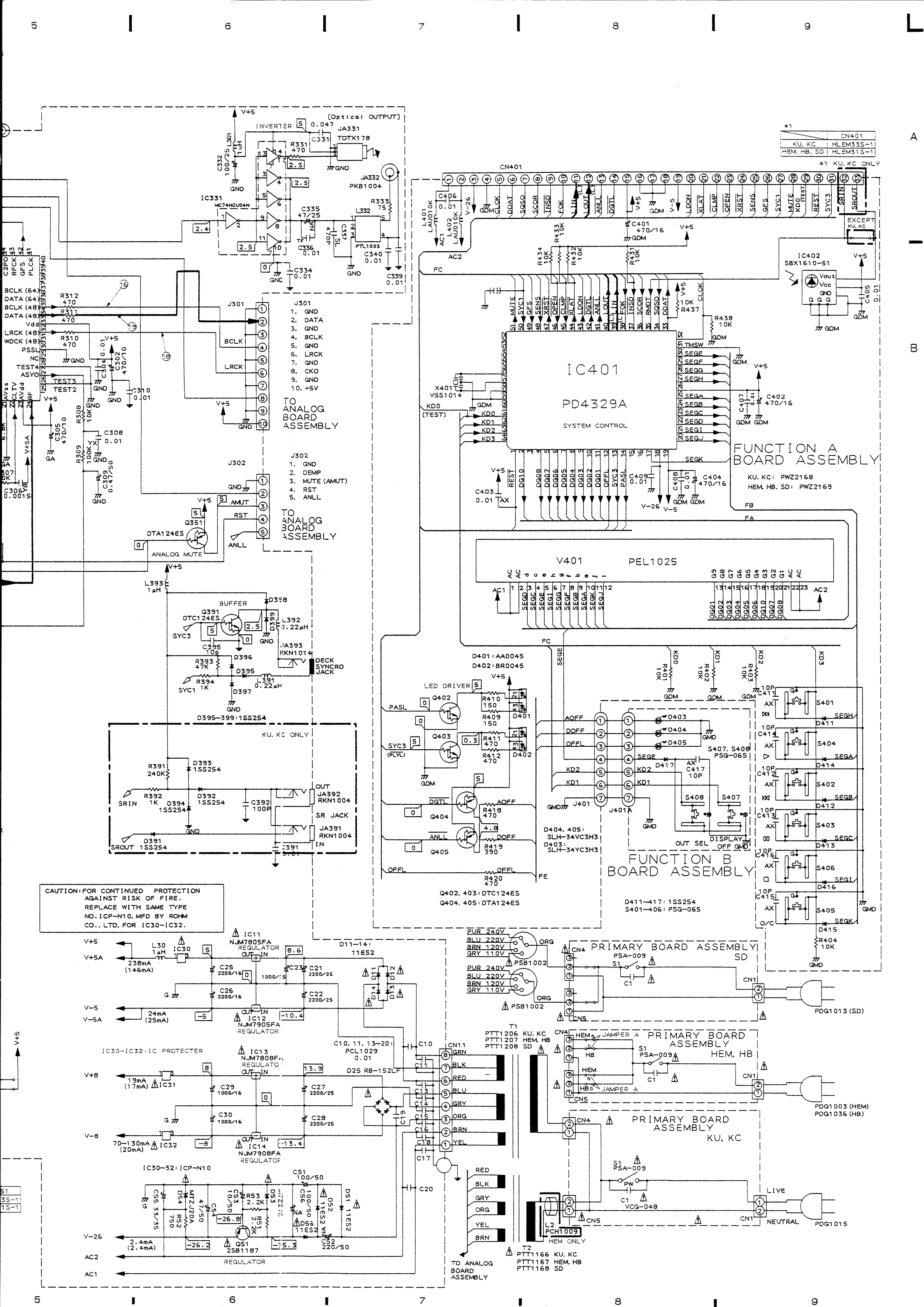
4.OTHERS :
➔ ; Signal route.
⊘ ; Adjusting point
The ⚠ mark found on some component parts indicates the inportance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
※ marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

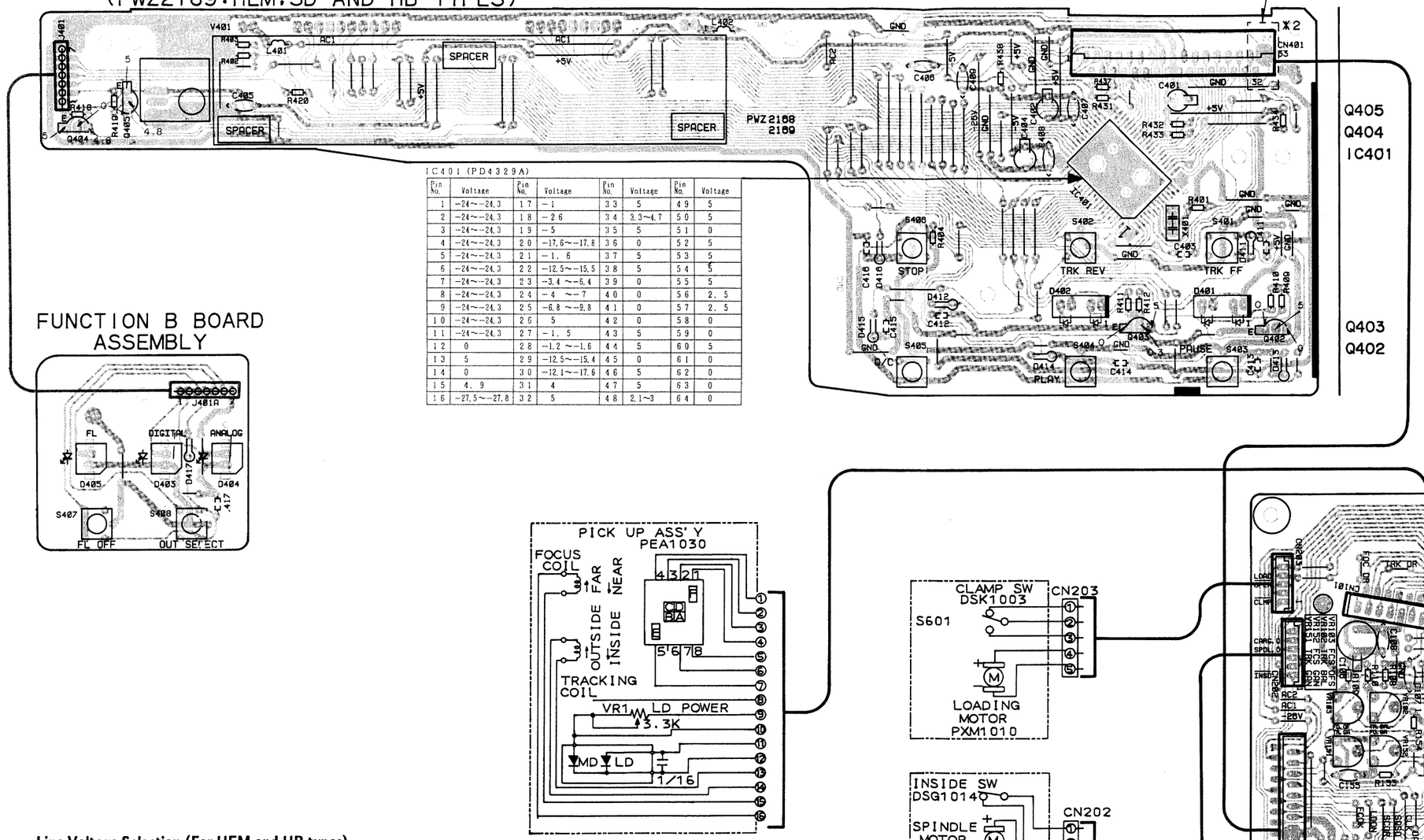
5. SWITCHES : (The underlined indicates the switch position)
PRIMARY BOARD ASSEMBLY
S1 POWER

FUNCTION A BOARD ASSEMBLY
S401 ⏭ ┐
S402 ⏮ ┘ TRACK SEARCH
S403 PAUSE(⏸)
S404 PLAY(▷)
S405 OPEN/CLOSE(⏏)
S406 STOP(□)

FUNCTION B BOARD ASSEMBLY
S407 DISPLAY OFF
S408 OUTPUT


[Optical OUTPUT]
INVERTER
JA331
TOTX178
JA332
PKB1004
IC331
MC74HCU04N
PTL1003
CN401
IC401
PD4329A
SYSTEM CONTROL
IC402
S8X1610-S1
V401
PEL1025
FUNCTION A BOARD ASSEMBLY
KU, KC: PWZ2168
HEM, HB, SD: PWZ2169
FUNCTION B BOARD ASSEMBLY
PRIMARY BOARD ASSEMBLY SD
PRIMARY BOARD ASSEMBLY HEM, HB
PRIMARY BOARD ASSEMBLY KU, KC
TO ANALOG BOARD ASSEMBLY
DECK SYNCRO JACK
SR JACK
KU, KC ONLY
EXCEPT KU, KC
HEM ONLY
CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE WITH SAME TYPE NO. ICP-N10, MFD BY ROHM CO., LTD. FOR IC30-IC32.
IC30-IC32: IC PROTECTER
IC30-32: ICP-N10
D401: AA0045
D402: BR0045
D395~399: 1SS254
D411~417: 1SS254
S401~406: PSG-065
Q402, 403: DTC124ES
Q404, 405: DTA124ES
D404, 405: SLH-34VC3H3
D403: SLH-34YC3H3
T1 PTT1206 KU, KC PTT1207 HEM, HB PTT1208 SD
T2 PTT1166 KU, KC PTT1167 HEM, HB PTT1168 SD
PDG1013 (SD)
PDG1003 (HEM)
PDG1036 (HB)
PDG1015

FUNCTION A BOARD ASSEMBLY
(PWZ2168:KU AND KC TYPES)
(PWZ2169:HEM,SD AND HB TYPES)



*2	CN401
KU,KC	33pins
HB,HEM,SD	31pins

IC401 (PD4329A)

Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	−24～−24.3	17	−1	33	5	49	5
2	−24～−24.3	18	−2.6	34	3.3～4.7	50	5
3	−24～−24.3	19	−5	35	5	51	0
4	−24～−24.3	20	−17.6～−17.8	36	0	52	5
5	−24～−24.3	21	−1.6	37	5	53	5
6	−24～−24.3	22	−12.5～−15.5	38	5	54	5
7	−24～−24.3	23	−3.4～−6.4	39	0	55	5
8	−24～−24.3	24	−4 ～−7	40	0	56	2.5
9	−24～−24.3	25	−6.8～−9.8	41	0	57	2.5
10	−24～−24.3	26	5	42	0	58	0
11	−24～−24.3	27	−1.5	43	5	59	0
12	0	28	−1.2～−1.6	44	5	60	5
13	5	29	−12.5～−15.4	45	0	61	0
14	0	30	−12.1～−17.6	46	5	62	0
15	4.9	31	4	47	5	63	0
16	−27.5～−27.8	32	5	48	2.1～3	64	0

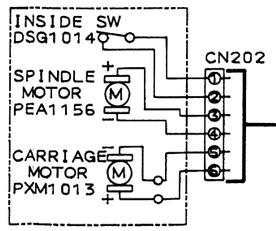
IC301 (CXD2500AQ)

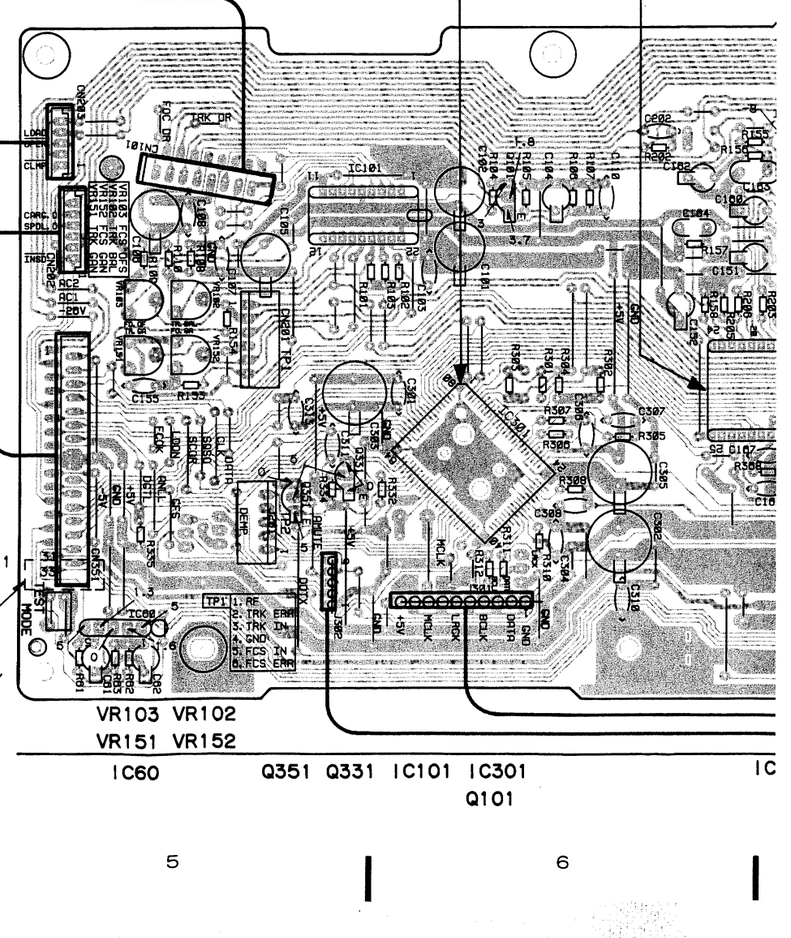
Pin No.	Voltage	Pin No.	Voltage
1	5	41	2.5
2	2.1	42	5
3	5	43	2.5
4	2.6	44	0
5	2.2	45	5
6	5	46	4.4
7	0	47	0
8	5	48	0
9	0	49	0～0.3
10	0	50	1.2
11	2.1	51	1.2
12	0	52	0
13	1.0	53	2.5
14	0.9～1.3	54	2.5
15	0	55	0
16	2.0	56	2.9
17	0	57	2.5
18	2.5	58	5
19	2.4	59	5
20	2.4	60	2.5
21	0	61	0
22	2.5	62	2.5
23	5	63	0
24	2.5	64	0
25	0.2	65	0
26	0	66	3.3～4.6
27	2.5	67	5
28	0	68	0
29	0	69	2.1～3
30	0	70	5
31	1.3～2.2	71	5
32	2.5	72	5
33	5	73	5
34	2.5	74	5
35	2.5	75	5
36	2.5	76	0
37	2.5	77	5
38	2.5	78	5
39	0	79	5
40	5	80	0

IC151 (CXA1372S)

Pin No.	Voltage	Pin No.	Vo
1	0	25	–
2	0	26	
3	0	27	
4	0	28	
5	0	29	
6	0	30	
7	0	31	
8	0	32	
9	0	33	
10	0	34	
11	1	35	
12	0	36	–
13	0.2	37	
14	0	38	
15	0	39	
16	5	40	–
17	0	41	–
18	0	42	
19	0	43	–
20	0.2～0.8	44	–
21	0	45	
22	−4	46	
23	1.3	47	–
24	0	48	

FUNCTION B BOARD ASSEMBLY





*1	CN351
KU,KC	33pins
HB,HEM,SD	31pins

Line Voltage Selection (For HEM and HB types)

Line voltage can be changed with the following steps.

1. Disconnect the AC power cord.
2. Remove the top cover.
3. Change the position of the jumper wire A as follows

Voltage	Jumper wire A position
220 V-230 V	a
230 V-240 V	b

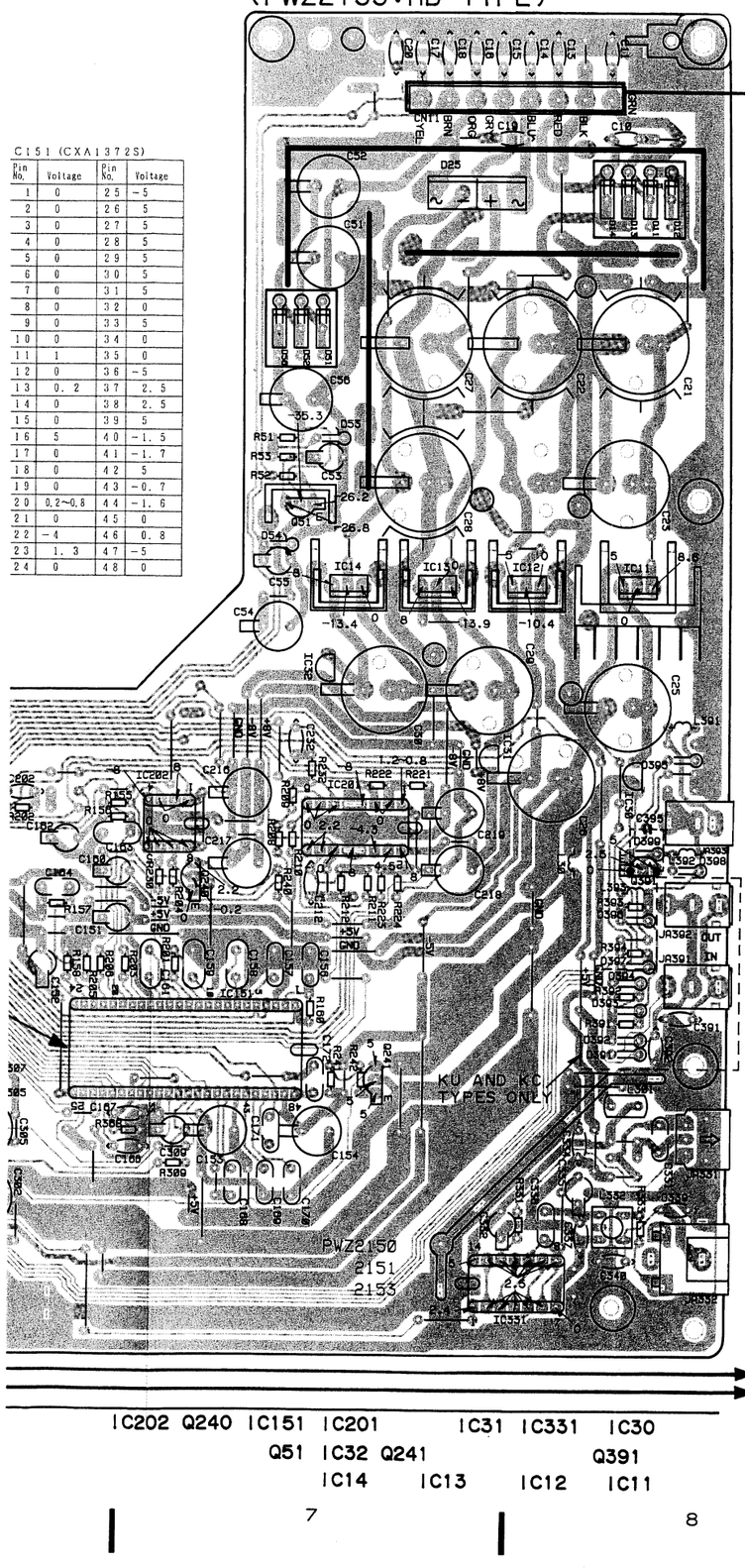
4. Stick the line voltage label on the rear panel.

Parts No.	Description
AXX-193	220 V label
AXX-192	240 V label

MAIN BOARD ASSEMBLY
(PWZ2150:KU AND KC TYPES)
(PWZ2151:HEM AND SD TYPES)
(PWZ2153:HB TYPE)

C151 (CXA1372S)

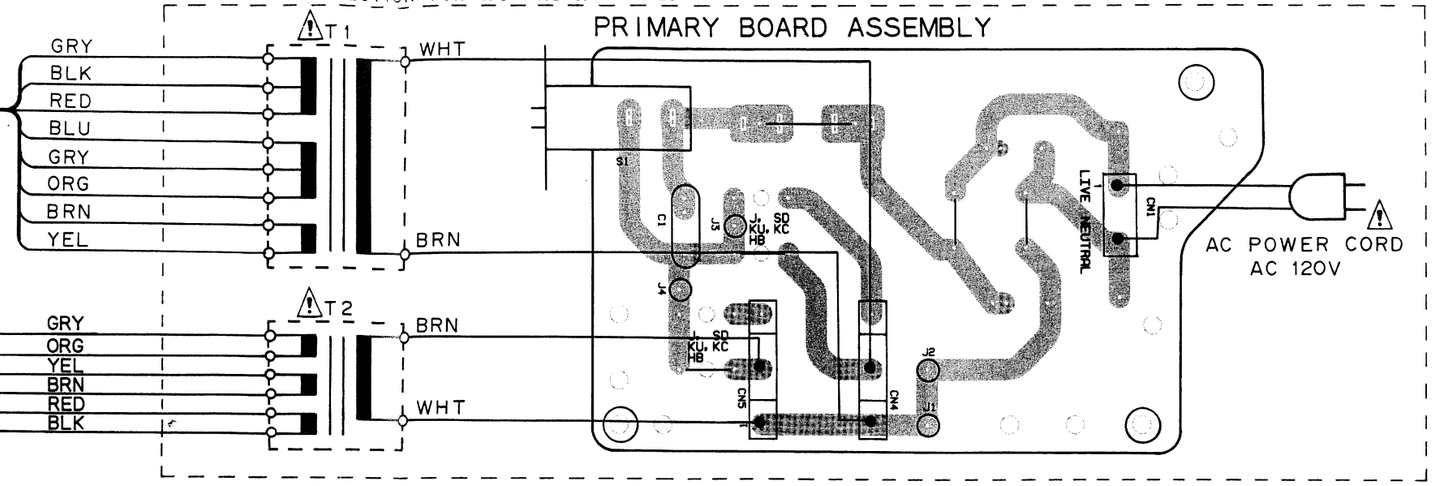
Pin No.	Voltage	Pin No.	Voltage
1	0	25	-5
2	0	26	5
3	0	27	5
4	0	28	5
5	0	29	5
6	0	30	5
7	0	31	5
8	0	32	0
9	0	33	5
10	0	34	0
11	1	35	0
12	0	36	-5
13	0.2	37	2.5
14	0	38	2.5
15	0	39	5
16	5	40	-1.5
17	0	41	-1.7
18	0	42	5
19	0	43	-0.7
20	0.2~0.8	44	-1.6
21	0	45	0
22	-4	46	0.8
23	1.3	47	-5
24	0	48	0



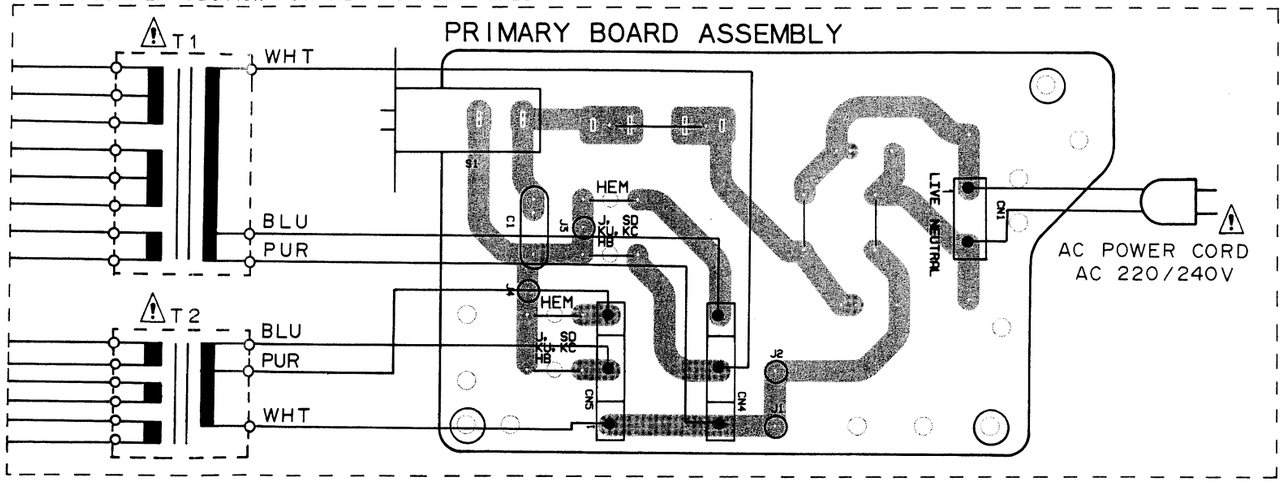
TO ANALOG BOARD ASSEMBLY

IC202 Q240 IC151 IC201 IC31 IC331 IC30
Q51 IC32 Q241 Q391
IC14 IC13 IC12 IC11

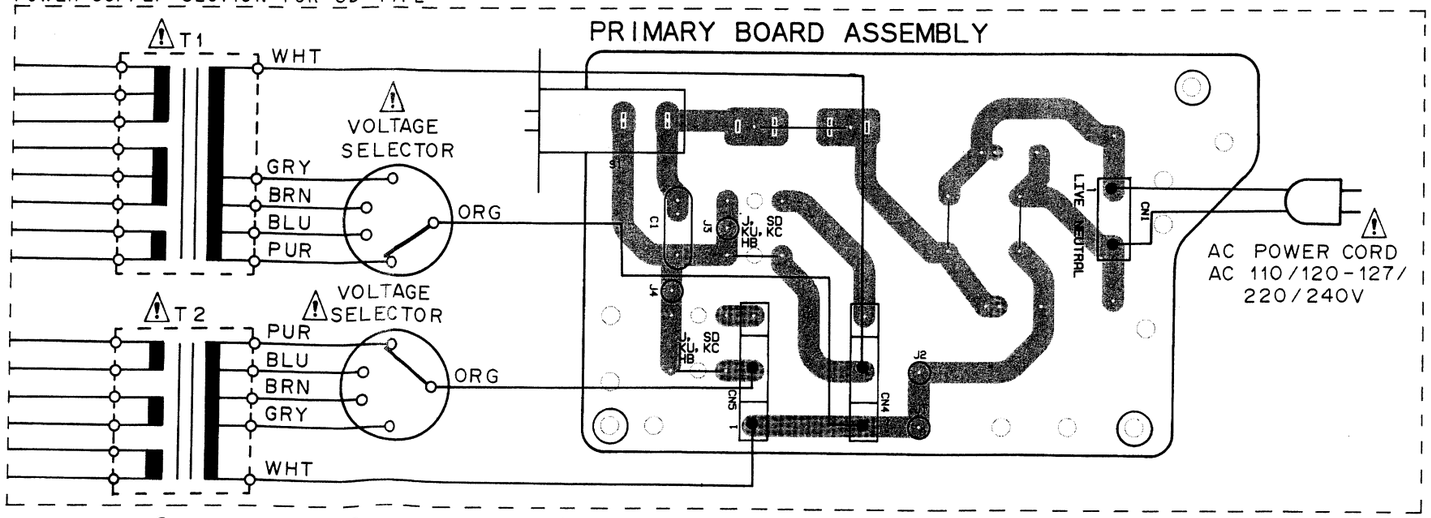
POWER SUPPLY SECTION FOR KU AND KC TYPES



POWER SUPPLY SECTION FOR HB AND HEM TYPES

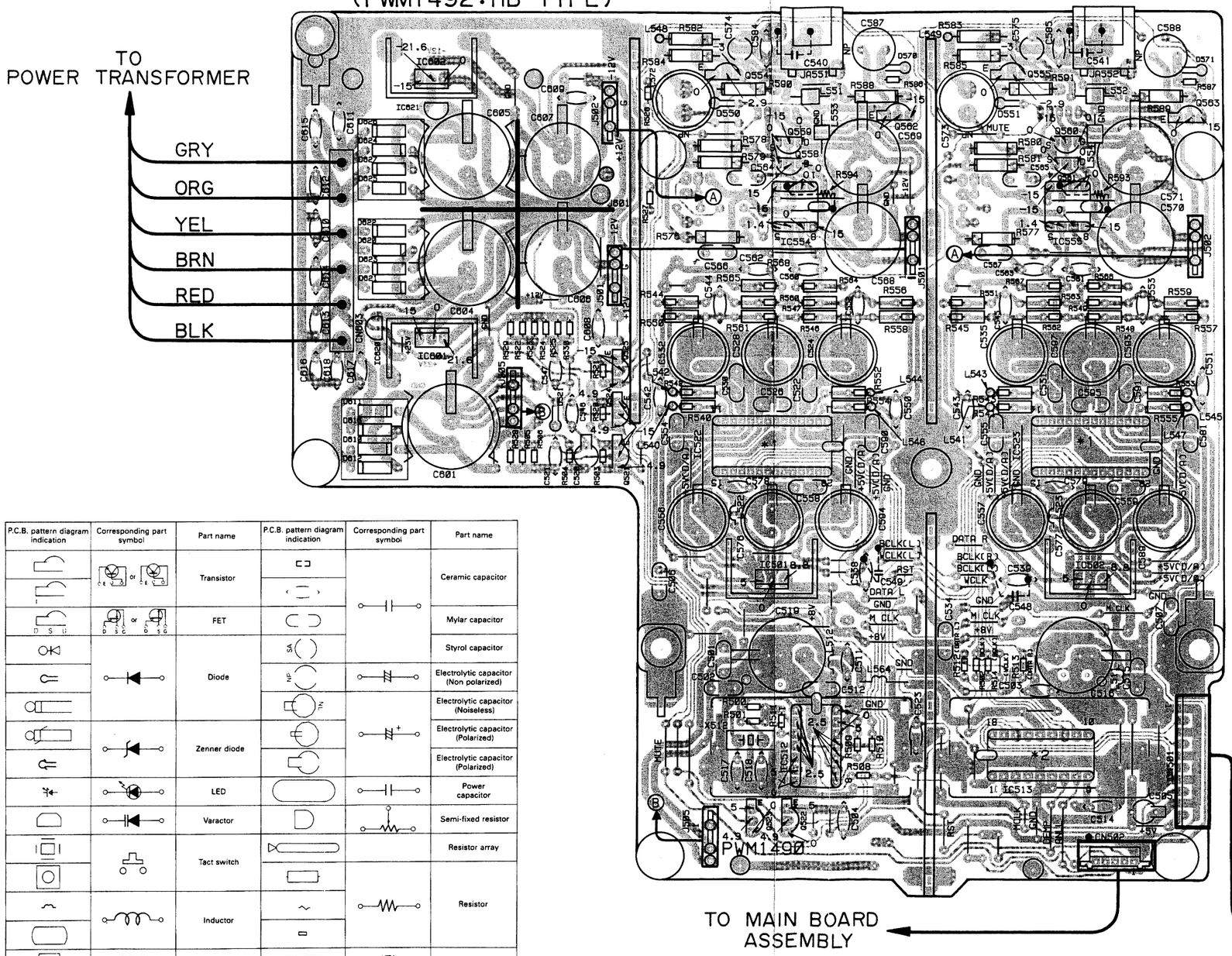


POWER SUPPLY SECTION FOR SD TYPE



4.2 ANALOG BOARD ASSEMBLY(PWM 1490)

ANALOG BOARD ASSEMBLY
(PWM1490:KU,KC,HEM AND SD TYPES)
(PWM1492:HB TYPE)



IC602
Q554 Q555
IC621 Q563
Q562
Q559 Q560
Q558 Q561

IC554 IC555

IC620
IC601
Q525

Q524
IC522 IC523
Q521

IC501 IC502

IC512
IC513

Q523 Q522

*1

IC522, IC523 (PD2028A)

Pin No.	Voltage	Pin No.	Voltage
1	0	15	5
2	2.6	16	5
3	2	17	5
4	0	18	0
5	5	19	3.8
6	5	20	2.2
7	2.3	21	0
8	2.5	22	0
9	0	23	0
10	5	24	0
11	0	25	3.2
12	2	26	2.5
13	2.6	27	0
14	0	28	5

*2

IC513 (SM5840CP)

Pin No.	Voltage
1	5
2	2.5
3	2.6
4	2.4
5	0
6	0
7	0
8	0
9	4
10	3
11	3.6
12	3.2
13	3.6
14	5
15	1.4
16	2.5
17	2.4
18	0

P.C.B. pattern diagram indication	Corresponding part symbol	Part name	P.C.B. pattern diagram indication	Corresponding part symbol	Part name
		Transistor			Ceramic capacitor
		FET			Mylar capacitor
		Diode			Styrol capacitor
					Electrolytic capacitor (Non polarized)
					Electrolytic capacitor (Noiseless)
		Zenner diode			Electrolytic capacitor (Polarized)
					Electrolytic capacitor (Polarized)
		LED			Power capacitor
		Varactor			Semi-fixed resistor
		Tact switch			Resistor array
					Resistor
		Inductor			
		Coil			Resonator
		Transformer			Thermistor
		Filter			

1. This P.C.B. connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the above Table.
3. The capacitor terminal marked with ▭ shows negative terminal.
4. The diode marked with O shows cathode side.
5. The transistor terminal marked with ▭ shows emitter.

*1	L540–L547
KU, KC, SD, HEM	USED
HB	SHORT (JUMPER)

TO MAIN BOARD ASSEMBLY

TO MAIN BOARD ASSEMBLY

CN501 KPC10

CN502

DIGITAL FILTER IC513 SM5840CP

DIGITAL SILENCE

INVERTER

LINE MUTE

D/A CONVERTOR IC522

D/A CONVERTOR IC523

IC522, 523 PD2028A

C578, 579 PCL1029

C503, C504: PCL1029

C578–C618 PCL1029

L540–L547: PTH1010 (FERRITE BEADS)

L564 PTH1006 (FERRITE BEADS)

BUFFER&DE-EMPHASIS

IC554 (1/2)

IC554(2/2)

IC555 (1/2)

IC555(2/2)

IC620, IC621: IC PROTECTOR

IC601, IC602: REGULATOR

CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE. REPLACE WITH SAME TYPE NO. ICP-N15, MFD BY ROHM CO., LTD. FOR IC620 AND IC621.

PWM1490 (KU, KC, SD, HEM) PWM1492 (HB)
ANALOG BOARD ASSEMBLY

AUDIO SIGNAL

4 5 6 7 8

*1	L540-L547
KU, KC, SD, HEM	USED
HB	SHORT (JUMPER)

L540-L547: PTH1010 (FERRITE BEADS)

Q554, 555, 562, 563: 2SC3068
Q558, 561: 2SK246
Q559, 560: 2SJ103
IC554, 555: NJM5532DD
C572, 573: PCH1094
C584, 585: PCL1029
L551~554: VTH1013 (FERRITE BEADS)
L548, 549: PTH1010 (FERRITE BEADS)

PWM1490 (KU, KC, SD, HEM) PWM1492 (HB)
ANALOG BOARD ASSEMBLY

CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE. REPLACE WITH SAME TYPE NO. ICP-N15, MFD BY ROHM CO., LTD. FOR IC620 AND IC621.

AUDIO SIGNAL

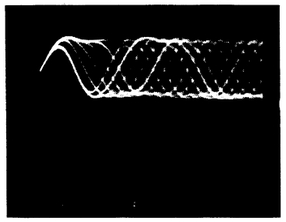
4.3 WAVEFORMS

Note:The encircled numbers denote measuring in the schematic diagram.

*1 50T-JUMP:After switching to the pause mode, press the manual search key.

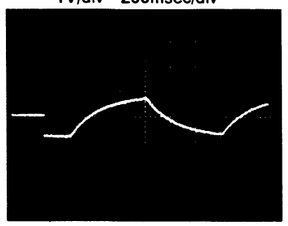
*2 FOCUS-IN:Press the key without loading a disc.

② TP1 - Pin 1:PLAY MODE
(RF)
500mV/div 500nsec/div



– GND

⑤ IC202-Pin 1 :FOCUS-IN(*2)MODE
(FODR)
1V/div 200msec/div

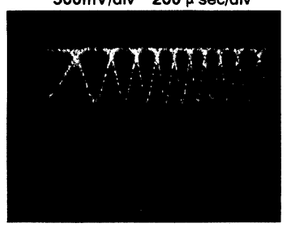


– GND

⑦ IC201-Pin 9:TRACK SEARCH MODE
(SPDR)
2V/div 50msec/div

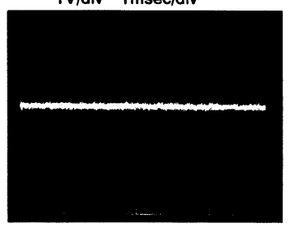
– GND

② TP1 - Pin 1:TRACK SEARCH MODE
(RF)
500mV/div 200 μ sec/div



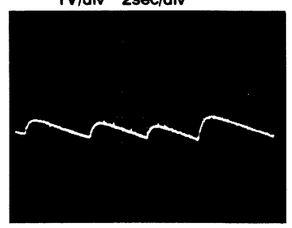
– GND

⑤ IC202-Pin 1 :PLAY MODE
(FODR)
1V/div 1msec/div



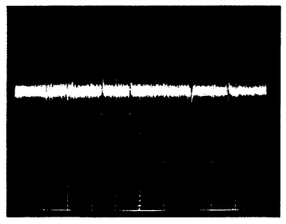
– GND

⑧ IC201 - Pin 4:PLAY MODE
(CADR)
1V/div 2sec/div



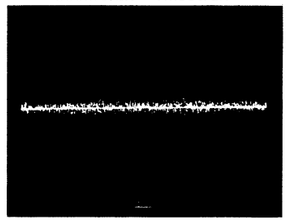
– GND

③ TP1 - Pin 6:PLAY MODE
(FOER)
100mV/div 10msec/div



– GND

⑥ IC202 - Pin 3:PLAY MODE
(TRDR)
500mV/div 1msec/div

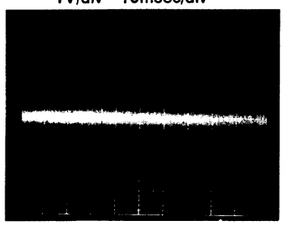


– GND

⑧ IC201 - Pin 4:TRACK SEARCH MODE
(CADR)
2V/div 200msec/div

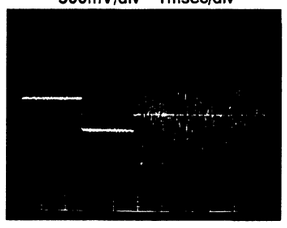
– GND

④ TP1 - Pin 2:PLAY MODE
(TRER)
1V/div 10msec/div



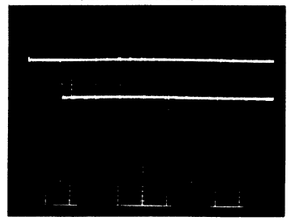
– GND

⑥ IC202 - Pin 3:50T - JUMP (*1) MODE
(TRDR)
500mV/div 1msec/div



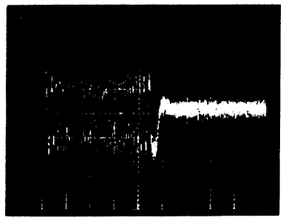
– GND

⑨ IC151 - Pin 38:PLAY MODE
(EFM)
2V/div 500nsec/div



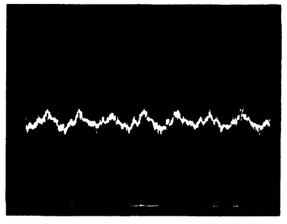
– GND

④ TP1 - Pin 2:50T - JUMP (*1) MODE
(TRER)
1V/div 1msec/div



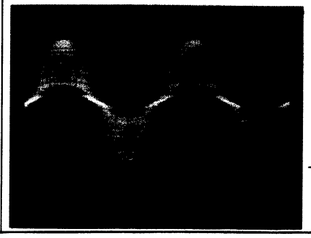
– GND

⑦ IC201-Pin 9:PLAY MODE
(SPDR)
1V/div 50msec/div



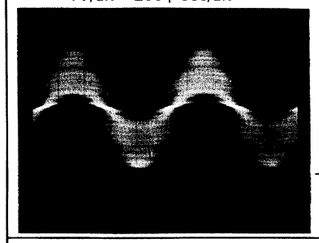
– GND

⑩ IC522-Pin 13 :PLAY MODE(1kHz)
($\overline{LO}$) (D/A DATA OUT)
1V/div 200 μ sec/div



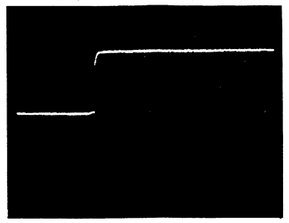
– GND

⑪ IC522-Pin 14 :PLAY MODE(1kHz)
(LO) (D/A DATA OUT)
1V/div 200 μ sec/div



– GND

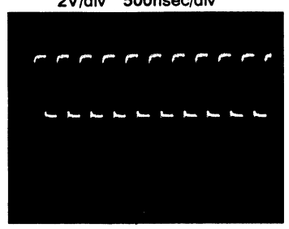
㉒ IC60-Pin 5 :POWER SWITCH-ON
(RST)
2V/div 100msec/div



– GND

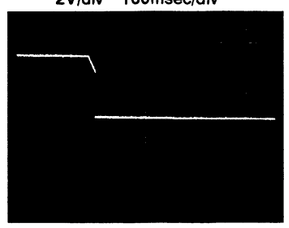
㉖

⑯ IC301 - Pin 35:PLAY MODE (1kHz)
(BCLK)
2V/div 500nsec/div



– GND

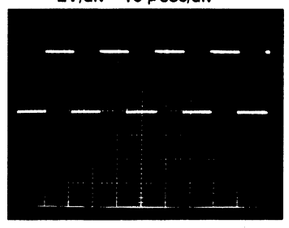
㉒ IC60-Pin 5 :POWER SWITCH-OFF
(RST)
2V/div 100msec/div



– GND

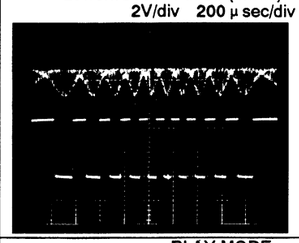
㉗

⑱ IC301 - Pin 32:PLAY MODE (1kHz)
(LRCK)
2V/div 10 μ sec/div



– GND

㉓ :TRACK SEARCH MODE
Upper:TP1 - Pin 1 (RF) 1V/div
Lower:IC151 - Pin 35 (MIRR)
2V/div 200 μ sec/div

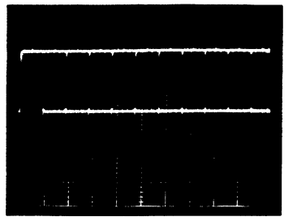


– GND

– GND

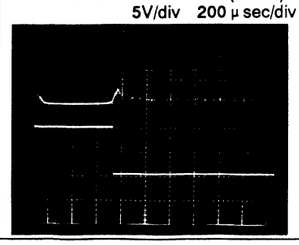
㉘

⑲ IC301 - Pin 34:PLAY MODE (1kHz)
(DATA)
2V/div 500nsec/div



– GND

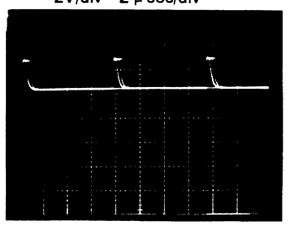
㉔ :PLAY MODE
Upper:TP1 - Pin 1 (RF) 1V/div
Lower:IC151 - Pin 36 (DFCT)
5V/div 200 μ sec/div



– GND

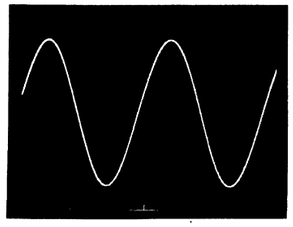
– GND

㉝ IC301 - Pin 4:PLAY MODE
(MDP)
2V/div 2 μ sec/div



– GND

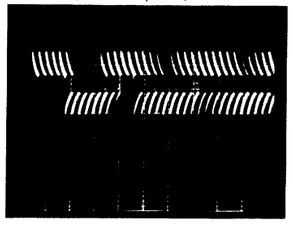
㉑ Pin - OUTPUT:PLAY MODE(1kHz)
1V/div 20 μ sec/div



– GND

㉕

㊸ IC301 - Pin 20:PLAY MODE
(PCO)
2V/div 10 μ sec/div



– GND

5. P.C.B.'s PARTS LIST

NOTES :

- *Parts without part number cannot be supplied.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex.1 *When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).*

560Ω	*56 × 10¹ 561*	*RD1/4PS 5 6 1 J*
47kΩ	*47 × 10³ 473*	*RD1/4PS 4 7 3 J*
0.5Ω	*0R5*	*RD2H 0 R 5 K*
1Ω	*010*	*RD1P 0 1 0 K*

Ex.2 *When there are 3 effective digits (such as in high precision metal film resistors).*

5.62kΩ 562 × 10¹ 5621 ····· *RD1/4SR 5 6 2 1 F*

Mark	No.	Description	Parts No.
◉ANALOG BOARD ASSEMBLY (PWM1490)			
SEMICONDUCTORS			
⚠	IC501,IC502	REGULATOR IC	NJM7805FA
	IC512	LOGIC IC	TC74HCU04AP
	IC513	DIGITAL FILTER,IC	SM5840CP
	IC522,IC523	D/A CONVERTER,IC	PD2028A
	IC554,IC555	OP-AMP IC	NJM5532DD
⚠	IC601	REGULATOR IC	NJM7812FA
⚠	IC602	REGULATOR IC	NJM7912FA
⚠	IC620,IC621	IC PROTECTOR	ICP-N15
	Q521	TRANSISTOR	DTC124ES
	Q522,Q523	TRANSISTOR	DTA124ES
	Q524,Q525	TRANSISTOR	DTC124ES
	Q554,Q555	TRANSISTOR	2SC3068
	Q558	TRANSISTOR	2SK246
	Q559,Q560	FET	2SJ103
	Q561	TRANSISTOR	2SK246
	Q562,Q563	TRANSISTOR	2SC3068
	D521	DIODE	1SS254
	D550,D551	DIODE	1SS254
	D570,D571	DIODE	1SS254
⚠	D610-D613	DIODE	10DF2
⚠	D620-D627	DIODE	10DF2
COILS AND FILTERS			
	L511,L512	AXIAL INDUCTOR	LAU010K
	L522,L523	AXIAL INDUCTOR	LAU010K
	L525,L526	AXIAL INDUCTOR	LAU010K
	L540-L549	FERRITE BEADS	PTH1010
	L551-L554	FERRITE BEADS	VTH1013
	L564		PTH1006

Mark	No.	Description	Parts No.
CAPACITORS			
	C501,C502	AUDIO FILM CAPACITOR	CFTXA104J50
	C503,C504	CERAMIC CAPACITOR	PCL1029
	C505	ELECTR.CAPACITOR	CEAS101M25
	C506,C507	AUDIO FILM CAPACITOR	CFTXA104J50
	C511	CERAMIC CAPACITOR	PCL1029
	C512	AUDIO FILM CAPACITOR	CFTXA103J50
	C514	CERAMIC CAPACITOR	CGCYF473Z25
	C515	AUDIO FILM CAPACITOR	CFTXA103J50
	C516	ELECTR.CAPACITOR	CEAS102M16
	C517,C518	CERAMIC CAPACITOR	CCCCH120J50
	C519	ELECTR.CAPACITOR	CEAS102M16
	C520	ELECTR.CAPACITOR	CEAS470M50
	C521	MYLOR FILM CAPACITOR	CQMA473J50
	C522	MYLOR FILM CAPACITOR	CQMA104J50
	C523	CERAMIC CAPACITOR	PCL1029
	C524	ELECTR.CAPACITOR	CEAS102M16
	C526	MYLOR FILM CAPACITOR	CQMA104J50
	C528	ELECTR.CAPACITOR	CEAS102M16
	C530,C531	MYLOR FILM CAPACITOR	CQMA104J50
	C532	ELECTR.CAPACITOR	CEAS102M16
	C534	AUDIO FILM CAPACITOR	CFTXA104J50
	C535	ELECTR.CAPACITOR	CEAS102M16
	C538,C539	CERAMIC CAPACITOR	CCCCH120J50
	C540,C541	CERAMIC CAPACITOR	CCDCH221J50
	C542,C543	CERAMIC CAPACITOR	CCCCH181J50
	C544,C545	CERAMIC CAPACITOR	CCCCH330J50
	C546,C547	CERAMIC CAPACITOR	CGCYF473Z25
	C548,C549	CERAMIC CAPACITOR	CCDCH080D50
	C550,C551	CERAMIC CAPACITOR	CCCCH181J50
	C552,C553	CERAMIC CAPACITOR	CCCCH330J50
	C554,C555	MYLOR FILM CAPACITOR	CQMA104J50
	C556,C557	ELECTR.CAPACITOR	CEAS102M16
	C558,C559	MYLOR FILM CAPACITOR	CQMA104J50
	C560-C563	CERAMIC CAPACITOR	CCCCH470J50
	C564,C565	MYLOR FILM CAPACITOR	CQMA681J50

Mark	No.	Description	Parts No.
	C566,C567	MYLOR FILM CAPACITOR	CQMA562J50
	C568-C571	ELECTR.CAPACITOR	CEAS471M50
	C572,C573	ELECTROLYTIC CAPACIT	PCH1094
	C574,C575	PL.STYRENE CAPACITOR	CQSA102J50
	C576,C577	ELECTR.CAPACITOR	CEAS102M16
	C578,C579	CERAMIC CAPACITOR	PCL1029
	C581	MYLOR FILM CAPACITOR	CQMA104J50
	C584,C585	CERAMIC CAPACITOR	PCL1029
	C587,C588	ELECTR.CAPACITOR	CEANP220M25
	C589	ELECTR.CAPACITOR	CEAS102M16
	C590,C591	MYLOR FILM CAPACITOR	CQMA104J50
	C593,C594	ELECTR.CAPACITOR	CEAS102M16
	C595	MYLOR FILM CAPACITOR	CQMA104J50
	C597	ELECTR.CAPACITOR	CEAS102M16
	C601	ELECTROLYTIC CAPACIT	CENA102M35
	C604,C605	ELECTR. CAPACITOR	PCH1102
	C606,C607	ELECTROLYTIC CAPACIT	CENA102M35
	C608-C618	CERAMIC CAPACITOR	PCL1029

RESISTORS

	R540-R567	CARBON FILM RESISTOR	RD1/4PM□□□J
	R576-R581	CARBON FILM RESISTOR	RDR1/4PM□□□J
	R582-R585	CARBON FILM RESISTOR	RDR1/2PM□□□J
	R588,R589	CARBON FILM RESISTOR	RDR1/2PM271J
	R590,R591	CARBON FILM RESISTOR	RDR1/4PM511J
	R593,R594	CARBON FILM RESISTOR	RDR1/4PM331J
	Other resistors		RD1/6PM□□□J

OTHERS

	CN501	CONNECTOR(10P)	KPC10
	JA551	1P PIN JACK(W)	RKB1010
	JA552	1P PIN JACK (R)	RKB1011
	X512	XTAL RES (OSC)	PSS1011
		SCREW	BBZ30P080FCC

◉MAIN BOARD ASSEMBLY (PWZ2150)

SEMICONDUCTORS

Mark	No.	Description	Parts No.
⚠	IC11	REGULATOR IC	NJM7805FA
	IC12	REGULATOR IC	NJM7905FA
⚠	IC13	REGULATOR IC	NJM7808FA
⚠	IC14	REGULATOR IC	NJM7908FA
⚠	IC30-IC32	IC PROTECTOR	ICP-N10
	IC60	SYSTEM RESET IC	M51957AL
	IC101	PRE AMP IC	CXA1471S
	IC151	SERVO IC	CXA1372S
⚠	IC201	POWER OP-AMP,IC	LA6520
⚠	IC202	POWER OP-AMP,IC	LA6517
	IC301	EFM DEMODULATION IC	CXD2500AQ
	IC331	IC	MC74HCU04N
⚠	Q51	TRANSISTOR	2SB1187
	Q101	TRANSISTOR	2SA854S
	Q240	TRANSISTOR	2SA933S
	Q241	TRANSISTOR	2SC1740S
	Q331	TRANSISTOR	DTC124ES
	Q351	TRANSISTOR	DTA124ES
	Q391	TRANSISTOR	DTC124ES
⚠	D11-D14	DIODE	11ES2
⚠	D25		RB-152LF
⚠	D51,D52	DIODE	11ES2
⚠	D53	ZENER DIODE	MTZ27C
⚠	D54	ZENER DIODE	MTZJ20A
⚠	D56	DIODE	11ES2
	D391-D399	DIODE	1SS254

COILS AND FILTERS

	L30	AXIAL INDUCTOR	LAU010K
	L301	RADIAL INDUCTOR	LRA010K
	L332	COIL	PTL1003
	L391,L392	AXIAL COIL	LAUR22K
	L393	AXIAL INDUCTOR	LAU010K

CAPACITORS

	C10,C11	CERAMIC CAPACITOR	PCL1029
	C13-C20	CERAMIC CAPACITOR	PCL1029
	C21,C22	ELECTR.CAPACITOR	CEAS222M25
	C23	ELECTR.CAPACITOR	CEAS102M25
	C25,C26	ELECTR.CAPACITOR	CEAS222M16
	C27,C28	ELECTR.CAPACITOR	CEAS222M25
	C29,C30	ELECTR.CAPACITOR	CEAS102M16
	C51	ELECTR.CAPACITOR	CEAS101M50
	C52	ELECTR.CAPACITOR	CEAS221M50
	C53	ELECTR.CAPACITOR	CEAS100M50
	C54	ELECTR.CAPACITOR	CEAS470M50
	C55	ELECTROLYTIC CAPACIT	CEAS330M35
	C56	ELECTR.CAPACITOR	CEAS101M50
	C61	ELECTR.CAPACITOR	CEASR33M50
	C62	ELECTR.CAPACITOR	CEAS010M50
	C101,C102	ELECTR.CAPACITOR	CEAS221M25
	C103	CERAMIC CAPACITOR	CCCCH200J50
	C104	ELECTR.CAPACITOR	CEAS101M10
	C105,C106	ELECTR.CAPACITOR	CEAS221M25
	C107,C108	CERAMIC CAPACITOR	CGCYX103K25
	C110	CERAMIC CAPACITOR	CKCYF103Z50
	C151-C154	ELECTR.CAPACITOR	CEAS221M25
	C155	CERAMIC CAPACITOR	CKCYB182K50
	C156	CERAMIC CAPACITOR	CGCYX333K25
	C157	CERAMIC CAPACITOR	CGCYX103K25
	C158,C159	MYLOR FILM CAPACITOR	CQMA104K50
	C160	ELECTR.CAPACITOR	CEAS4R7M50
	C161	MYLOR FILM CAPACITOR	CQMA104K50
	C162	ELECTR.CAPACITOR	CEAS010M50
	C163	MYLOR FILM CAPACITOR	CQMA104K50
	C164	CERAMIC CAPACITOR	CGCYX103K25
	C166	CERAMIC CAPACITOR	CCCSL101J50
	C167	CERAMIC CAPACITOR	CKCYF103Z50
	C168	CERAMIC CAPACITOR	CGCYX333K25
	C169	CERAMIC CAPACITOR	CGCYX103K25

Mark	No.	Description	Parts No.
	C170	CERAMIC CAPACITOR	CKCYB332K50
	C171,C172	CERAMIC CAPACITOR	CKCYB472K50
	C202	CERAMIC CAPACITOR	CKCYF103Z50
	C212	CERAMIC CAPACITOR	CKCYB272K50
	C216-C219	ELECTR.CAPACITOR	CEAS221M25
	C232	CERAMIC CAPACITOR	CKCYF103Z50
	C301	CERAMIC CAPACITOR	CGCYX103K25
	C302,C303	ELECTR.CAPACITOR	CEAS471M10
	C304	CERAMIC CAPACITOR	CGCYX103K25
	C305	ELECTR.CAPACITOR	CEAS471M10
	C306	CERAMIC CAPACITOR	CKCYB152K50
	C307	CERAMIC CAPACITOR	CGCYX473K25
	C308	CERAMIC CAPACITOR	CGCYX103K25
	C309	ELECTR.CAPACITOR	CEASR47M50
	C310	CERAMIC CAPACITOR	CKCYF103Z50
	C311	CERAMIC CAPACITOR	CKCYB102K50
	C313	CERAMIC CAPACITOR	CKCYF103Z50
	C331	CERAMIC CAPACITOR	CGCYX473K25
	C332	ELECTR.CAPACITOR	CEAS101M25
	C334	CERAMIC CAPACITOR	CGCYX103K25
	C335	ELECTR.CAPACITOR	CEAS470M25
	C336	AUDIO FILM CAPACITOR	CFTXA103J50
	C337	CERAMIC CAPACITOR	CCCSL471J50
	C339,C340	CERAMIC CAPACITOR	CGCYX103K25
	C391	CERAMIC CAPACITOR	CGCYX103K25
	C392	CERAMIC CAPACITOR	CCCSL101J50
	C395	CERAMIC CAPACITOR	CCDSL100D50
RESISTORS			
	VR102	VR	VRTB6VS223
	VR103	VR	VRTB6VS102
	VR151	VR	VRTB6VS223
	VR152	VR	VRTB6VS223
	Other resistors		RD1/6PM□□□J
OTHERS			
	CN101	CONNECTOR	52045-1610
	CN351	CONNECTOR	HLEM33S
	JA331	OPTICAL OUTPUT JACK	TOTX178
	JA332	JACK	PKB1004
	JA391,JA392	JACK	RKN1004
	JA393	JACK	RKN1014

PRIMARY BOARD ASSEMBLY

Mark	No.	Description	Parts No.
SWITCHES			
⚠	S1	SWITCH (POWER)	PSA-009
CAPACITORS			
⚠	C1	CAPACITOR (CERAMIC)	VCG-048

Mark	No.	Description	Parts No.
◉FUNCTION A BOARD ASSEMBLY (PWZ2168)			
SEMICONDUCTORS			
	IC401	MICROCOMPUTER,IC	PD4329A
	Q402,Q403	TRANSISTOR	DTC124ES
	Q404,Q405	TRANSISTOR	DTA124ES
	D401	LED	AA0045
	D402	LED	BR0045
	D411-D416	DIODE	1SS254
SWITCHES			
	S401-S406	SWITCH (TRK FF, TRK REV, PAUSE / PLAY, OPEN/CLOSE, STOP)	PSG-065
FILTERS			
	L401,L402	AXIAL INDUCTOR	LAU010K
CAPACITORS			
	C401,C402	ELECTROLYTIC CAPACIT	CEJA470M16
	C403	CERAMIC CAPACITOR	CKPUYF103Z25
	C404	ELECTROLYTIC CAPACIT	CEJA470M16
	C405	CERAMIC CAPACITOR	CKPUYF103Z25
	C406-C408	CERAMIC CAPACITOR	CGCYX103K25
	C409	CERAMIC CAPACITOR	CKCYF103Z50
	C411-C416	AXIAL CERAMIC C.	CCPUCH100J50
RESISTORS			
	All resistors		RD1/6PM□□□J
OTHERS			
	CN401	CONNECTOR	HLEM33R
	V401	FL TUBE	PEL1025
	X401	CERAMIC RESONATOR	VSS1014
	REMOTE SENSOR		SBX1610

FUNCTION B BOARD ASSEMBLY

Mark	No.	Description	Parts No.
SEMICONDUCTORS			
	D403	LED	SLH-34YC3H3
	D404	LED	SLH-34VC3H3
	D405	LED	SLH-34VC3H3
	D417	DIODE	1SS254
SWITCHES			
	S407,S408	SWITCH (DISPLAY OFF, OUTPUT)	PSG-065
CAPACITORS			
	C417	AXIAL CERAMIC C.	CCPUCH100J50

6. ADJUSTMENTS

If a disc player is adjusted incorrectly or inadequately, it may malfunction or not work at all even though there is nothing at all wrong with the pick up or the circuitry. Adjust correctly following the adjustment procedure.

6-1. Adjustment items/verification item and order

Step	Item	Test point	Adjustment location
1	Focus offset adjustment	TP 1, Pin 6(FCS.ERR)	VR 103(FCS.OFS)
2	Grating adjustment	TP 1, Pin 2(TRK.ERR)	Grating adjustment slit
3	Tracking error balance adjustment	TP 1, Pin 2(TRK.ERR)	VR 102(TRK. BAL)
4	Pick up radial/tangential direction tilt adjustment	TP 1, Pin 1(RF)	Radial tilt adjustment screw, Tangential tilt adjustment screw
5	RF level adjustment (RF level)	TP 1, Pin 1(RF)	VR 1(RF level)
6	Focus servo loop gain adjustment	TP 1, Pin 5(FCS.IN) TP 1, Pin 6(FCS.ERR)	VR 152(FCS.GAN)
7	Tracking servo loop gain adjustment	TP 1, Pin 3(TRK.IN) TP 1, Pin 2(TRK.ERR)	VR 151(TRK.GAN)
8	Focus error signal verification	TP 1, Pin 6(FCS.ERR)	–

- Abbreviation table
  - FCS.ERR : Focus Error
  - FCS.OFS : Focus Offset
  - TRK.ERR : Tracking Error
  - TRK.BAL : Tracking Balance
  - FCS.GAN : Focus Gain
  - TRK.GAN : Tracking Gain
  - FCS.IN : Focus In
  - TRK.IN : Tracking In

6-2. Measuring instruments and tools

1. Dual trace oscilloscope (10 : 1 probe)
2. Low-frequency oscillator
3. Test disc (YEDS-7)
4. Low-pass filter (39 kΩ+ 0.001 μF)
5. Resistor (100 kΩ)
6. Standard tools

6-3. Test point and adjustment variable resistor positions

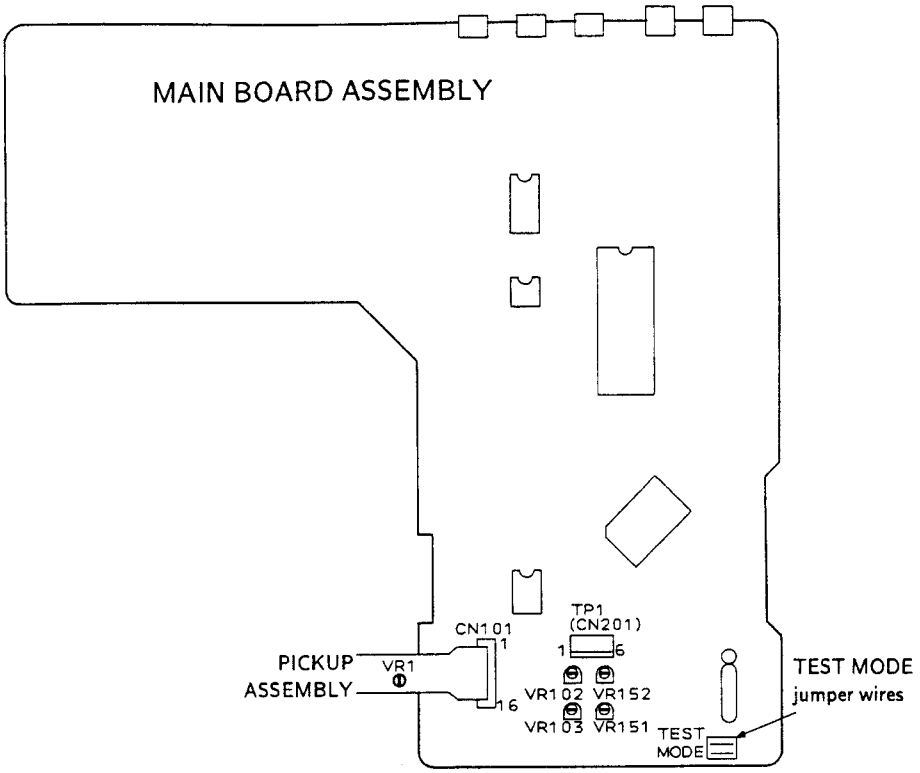


Figure 1 Adjustment Locations

6-4. Notes

1. Use a 10 : 1 probe for the oscilloscope.
2. All the knob positions (settings) for the oscilloscope in the adjustment procedures are for when a 10 : 1 probe is used.

6-5. Test mode

These models have a test mode so that the adjustments and checks required for service can be carried out easily. When these models are in test mode, the keys on the front panel work differently from normal. Adjustments and checks can be carried out by operating these keys with the correct procedure. For these models, all adjustments are carried out in test mode.

[Setting these models to test mode]

How to set this model into test mode.

1. Turn off the power switch.
2. Short the test mode jumper wires. (See Figure 1.)
3. Turn on the power switch.

When the test mode is set correctly, the display is different from what it usually is when the power is turned on. If the display is still the same as usual, test mode has not been set correctly, so repeat steps 1-3.

[Release from test mode]

Here is the procedure for releasing test mode :

1. Press the STOP key to stop all operations.
2. Turn off the power switch on the front panel.

[Operations of the keys in test mode]

Code	Key name	Function in test mode	Explanation
	OUTPUT	Focus servo close	The laser diode is lit up and the focus actuator is lifted up, then lowered slowly and the focus servo is closed at the point where the objective lens is focused on the disc. With the player in this state, if you lightly rotate the stopped disc by hand, you can hear the sound the focus servo. If you can hear this sound, the focus servo is operating correctly. If you press this key with no disc mounted, the laser diode lights up, the focus actuator is pulled up, then the actuator is lowered and raised twice and returned to its original position.
▷	PLAY	Spindle servo On	Starts the spindle motor in the clockwise direction and when the disc rotation reaches the prescribed speed (about 500 rpm at the inner periphery), sets the spindle servo in a closed loop. Be careful. Pressing this key when there is no disc mounted makes the spindle motor run at the maximum speed. If the focus servo does not go correctly into a closed loop or the laser light shines on the mirror section at the periphery edge of the disc, the same symptom is occurred.
▯▯	PAUSE	Tracking servo close/open	Pressing this key when the focus servo and spindle servo are operating correctly in closed loops puts the tracking servo into a closed loop, displays the track number being played back and the elapsed time on the front panel, and outputs the playback signal. If the elapsed time is not displayed or not counted correctly or the audio is not played back correctly, it may be that the laser is shining on the section with no sound recorded at the outer edge of the disc, that something is out of adjustment, or that there is some other problem. This key is a toggle key and open/close the tracking servo alternately. This key has no effect if no disc is mounted.

Code	Key name	Function in test mode	Explanation
⏮	TRACK REV	Carriage reverse (inwards)	Moves the pickup position toward the inner diameter of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the pickup does not automatically stop at the mechanical end point in test mode, be careful with this operation.
⏭	TRACK FWD	Carriage forward (outwards)	Moves the pickup position toward the outer diameter of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the pickup does not automatically stop at the mechanical end point in test mode, be careful with this operation.
□	STOP	Stop	Initializes and the disc rotation stops. The pickup and disc remain where they are when this key is pressed.
⏏	OPEN/CLOSE	Disc tray open/close	Opens/closes the disc tray. This key is a toggle key and open/close tray alternately.

[How to play back a disc in test mode]

In test mode, since the servos operate independently, playing back a disc requires that you operate the keys in the correct order to close the servos.
Here is the key operation sequence for playing back a disc in test mode.

OUTPUT	Lights up the laser diode and closes the focus servo.
⇩	
PLAY ▷	Starts the spindle motor and closes the spindle servo.
⇩	
PAUSE ▯▯	Closes the tracking servo.

Wait at least 2-3 seconds between each of these operations.

1. Focus offset adjustment

● Objective	Sets the DC offset for the focus error amp.		
● Symptom when out of adjustment	The model does not focus in and the RF signal is dirty.		
● Measurement instrument connections	Connect the oscilloscope to TP 1, Pin 6 (FCS ERR). [Settings] 5 mV/division 10 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, stopped (just the Power switch on) VR 103 (FCS OFS) None needed

[Procedure]
Adjust VR 103 (FCS OFS) so that the DC voltage at TP 1, Pin 6 (FCS ERR) is −150±50 mV.

2. Grating adjustment

● Objective	To align the tracking error generation laser beam spots to the optimum angle on the track.		
● Symptom when out of adjustment	Play does not start, track search is impossible, tracks are skipped.		
● Measurement instrument connections	Connect the oscilloscope to TP 1, Pin 2 (TRK ERR) via a low pass filter. (See Figure 2) [Settings] 50 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, focus and spindle servos closed and tracking servo open. Pickup grating adjustment slit YEDS-7

[Procedure]

1. Move the pickup to midway across the disc(R=35 mm) with the TRACK FWD ⏭ or REV ⏮ key.

2. Press the OUTPUT key, then the PLAY ▷ key in that order to close the focus servo then the spindle servo.

3. Insert an ordinary screwdriver into the grating adjustment slit and adjust the grating to find the null point. For more details, see the next page.

4. If you slowly turn the screwdriver clockwise from the null point, the amplitude of the wave gradually increases, then if you continue turning the screwdriver, the amplitude of the wave becomes smaller again.
   Turn the screwdriver clockwise from the null point and set the grating to the first point where the wave amplitude reaches its maximum.

   Reference : Figure 3 shows the relation between the angle of the tracking beam with the track and the waveform.
   Note : The amplitude of the tracking error signal is about 3 Vp-p (when a 39 kΩ + 0.001 μF low pass filter is used). If this amplitude is extremely small (2 Vp-p or less), then the objective lens or the pickup malfunction may be the cause. If the difference between the amplitude of the error signal at the innermost edge and outermost edge of the disc is more than 10%, the grating is not adjusted to the optimum point, so adjust it again.

5. Return the pickup to more or less midway across the disc with the TRACK REV ⏮ key, press the PAUSE ⏸ key and double check that the track number and elapsed time are displayed on the front panel. If they are not displayed at this time or the elapsed time changes irregularly, double check the null point and adjust the grating again.

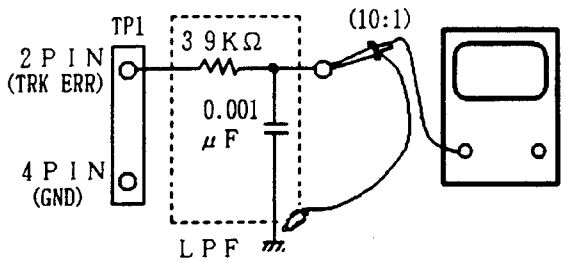
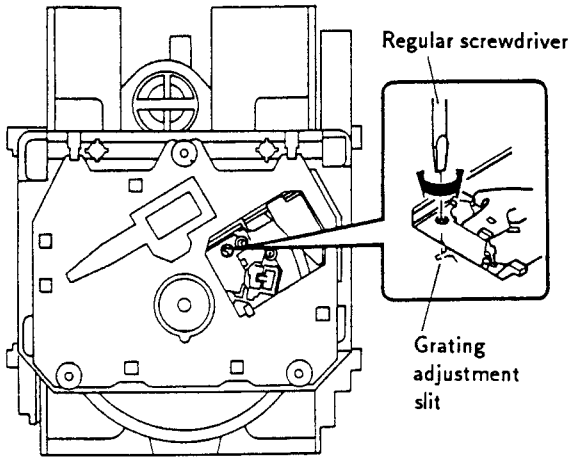


Figure 2



Adjustment locations

[How to find the null point]

When you insert the regular screwdriver into the slit for the grating adjustment and change the grating angle, the amplitude of the tracking error signal at TP 1 Pin 2 changes. Within the range for the grating, there are five or six locations where the amplitude of the wave reaches a minimum. Of these five or six locations, there is only one at which wave form is smooth. This location is where the three laser beams divided by the grating are all right above the same track. (See Figure 3.)
This point is called the null point. When adjusting the grating, this null point is found and used as the reference position.

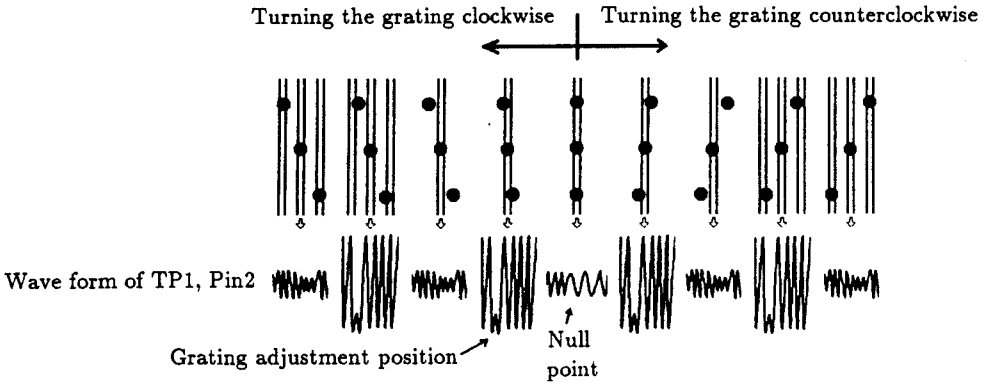
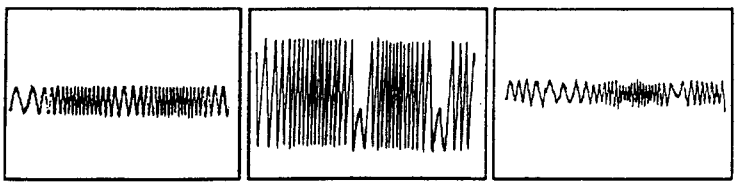


Figure 3



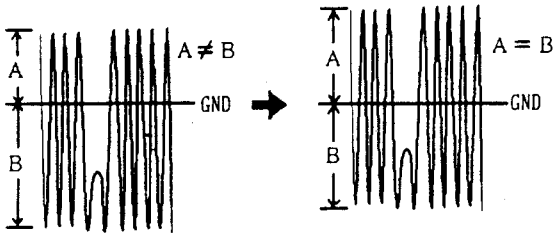
Null point wave form | Maximum amplitude wave form | Wave form other than the null point

3. Tracking error balance adjustment

● Objective	To correct for the variation in the sensitivity of the tracking photodiode.		
● Symptom when out of adjustment	Play does not start or track search is impossible.		
● Measurement instrument connections	Connect the oscilloscope to TP 1, Pin 2 (TRK ERR). This connection may be via a low pass filter. [Settings] 50 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, focus and spindle servos closed and tracking servo open VR 102 (TRK BAL) YEDS-7

[Procedure]

1. Move the pickup to midway across the disc (R = 35 mm) with the TRACK FWD ⏭ or REV ⏮ key.
2. Press the OUTPUT key, then the PLAY key in that order to close the focus servo then the spindle servo.
3. Line up the bright line (ground) at the center of the oscilloscope screen and put the oscilloscope into DC mode.
4. Adjust VR 102 (TRK BAL) so that the positive amplitude and negative amplitude of the tracking error signal at TP 1 Pin 2 (TRK ERR) are the same (in other words, so that there is no DC component).



When there is a DC component

When there is no DC component

4. Pickup radial/tangential tilt adjustment

● Objective	To adjust the angle of the pickup relative to the disc so that the laser beams are shone straight down into the disc for the best read out of the RF signals.		
● Symptom when out of adjustment	Sound broken ; some discs can be played but not others.		
● Measurement instrument connections	Connect the oscilloscope to TP 1, Pin 1 (RF). [Settings] 20 mV/division 200 ns/division AC mode	● Player state	Test mode, play
		● Adjustment location	Pickup radial tilt adjustment screw and tangential tilt adjustment screw
		● Disc	YEDS-7

[Procedure]

1. Press the TRACK FWD ⏭ or REV ⏮ key to move the pickup to halfway across the disc (R = 35 mm). Press the OUTPUT key, the PLAY ▷ key, then the PAUSE ⏸ key in that order to close the focus servo then the spindle servo and put the player into play mode.

2. First, adjust the radial tilt adjustment screw with a Phillips screwdriver so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly.

3. Next, adjust the tangential tilt adjustment screw with a Phillips screwdriver so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly (Figure 5).

4. Adjust the radial tilt adjustment screw and the tangential tilt adjustment screw again so that the eye pattern can be seen the most clearly. As necessary, adjust the two screws alternately so that the eye pattern can be seen the most clearly.

Note : Radial and tangential mean the directions relative to the disc shown in Figure 4.

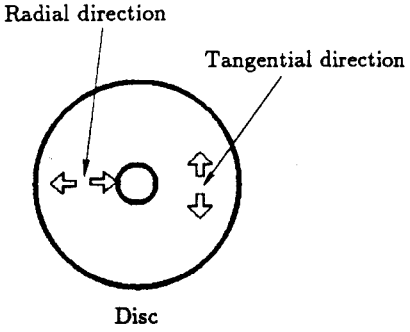
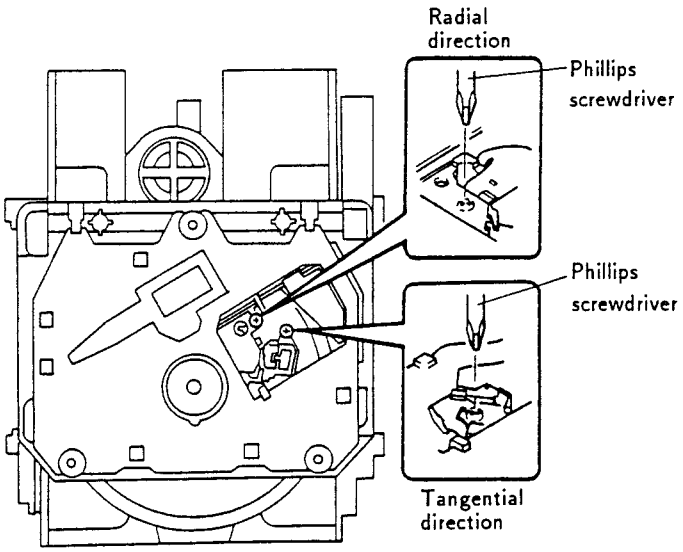


Figure 4



Adjustment locations

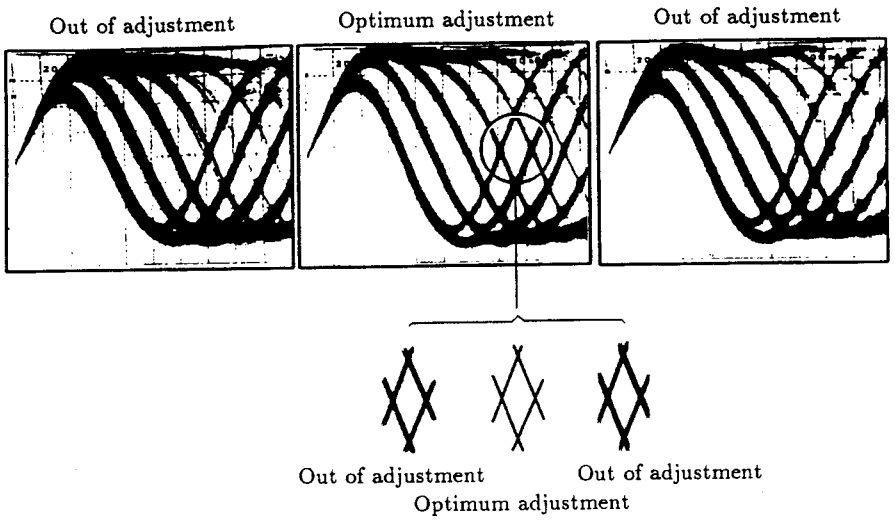


Figure 5 Eye pattern

5. RF level adjustment

● Objective	To optimize the playback RF signal amplitude		
● Symptom when out of adjustment	No play or no search		
● Measurement instrument connections	Connect the oscilloscope to TP 1, Pin 1 (RF). [Settings] 50 mV/division 10 ms/division AC mode	● Player state ● Adjustment location ● Disc	Test mode, play VR 1 (laser power) YEDS-7

[Procedure]

1. Move the pickup to midway across the disc (R = 35 mm) with the TRACK FWD ⏭ or REV ⏮ key, then press the OUTPUT key, then the PLAY ▷ key in that order to close the respective servos and put the player into play mode..

2. Adjust VR 1 (laser power) so that the RF signal amplitude is 1.2 Vp-p±0.1 V.

6. Focus servo loop gain adjustment

● Objective	To optimize the focus servo loop gain		
● Symptom when out of adjustment	Playback does not start or focus actuator noisy		
● Measurement instrument connections	See Figure 6. [Settings] CH 1 CH 2 20 mV/division 5 mV/division X-Y mode	● Player state ● Adjustment location ● Disc	Test mode, play VR 152 (FCS GAN) YEDS-7

[Procedure]

1. Set the AF generator output to 1.2 kHz and 1 Vp-p.

2. Press the TRACK FWD ⏭ or REV ⏮ key to move the pickup to halfway across the disc (R = 35 mm), then press the OUTPUT key, the PLAY ▷ key, then the PAUSE ⏸ key in that order to close the corresponding servos and put the player into play mode.

3. Adjust VR 152 (FCS GAN) so that the Lissajous wave form is symmetrical about the X axis and the Y axis.

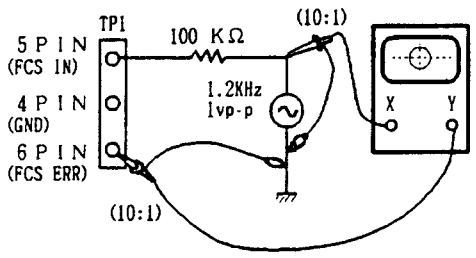
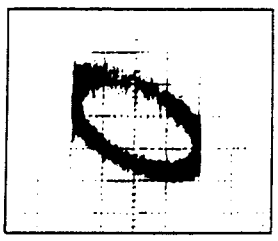


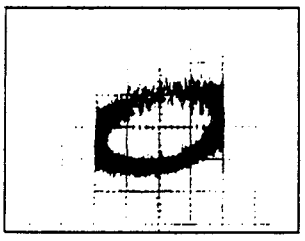
Figure 6

Focus Gain Adjustment



Higher gain

Optimum gain



Lower gain

7. Tracking servo loop gain adjustment

● Objective	To optimize the tracking servo loop gain		
● Symptom when out of adjustment	Playback does not start, during searches the actuator is noisy, or tracks are skipped.		
● Measurement instrument connections	See Figure 7. [Settings] CH 1 CH 2 50 mV/division 50 mV/division X-Y mode	● Player state ● Adjustment location ● Disc	Test mode, play VR 151 (TRK GAN) YEDS-7

[Procedure]

1. Set the AF generator output to 1.2 kHz and 1 Vp-p.

2. Press the TRACK FWD ⏭ or REV ⏮ key to move the pickup to halfway across the disc (R = 35 mm), then press the OUTPUT key, the PLAY ▷ key, then the PAUSE ⏸ key in that order to close the corresponding servos and put the player into play mode.

3. Adjust VR 151 (TRK GAN) so that the Lissajous wave form is symmetrical about the X axis and the Y axis.

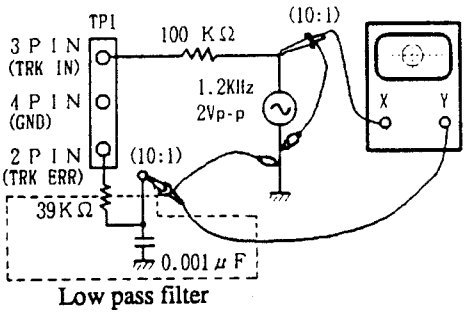
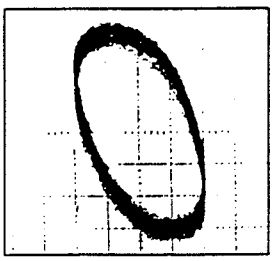
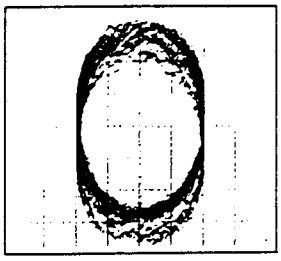


Figure 7

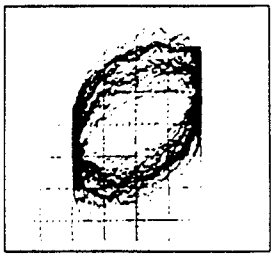
Tracking Gain Adjustment



Higher gain



Optimum gain



Lower gain

8. Focus error signal(focus S curve)verification

● Objective ● Symptom when out of adjustment	To judge whether the pickup is O.K. or not by observing the focus error signal. The pickup is judged from the amplitude of the tracking error signal (as discussed in the section on adjusting the tracking error balance) and the wave form for the focus error signal.		
● Measurement instrument connections	Connect the oscilloscope to TP 1 Pin 6 (FOCS ERR). [Settings] 100 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, stop None YEDS-7

[Procedure]

1. Connect TP 1 Pin 5 to ground.

2. Mount the disc.

3. While watching the oscilloscope screen, press the OUTPUT key and observe the waveform in Figure 8 for a moment. Verify that the amplitude is at least 2.5 Vp-p and that the positive and negative amplitude are about equal. Since the waveform is only output for a moment when the OUTPUT key is pressed, press this key over and over until you have checked the waveform.

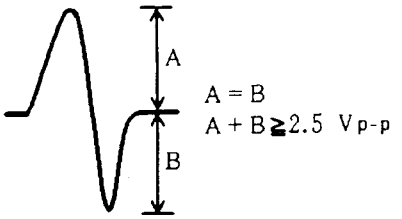


Figure 8

[Judging the pickup]

Do not judge the pickup until all the adjustments have been made correctly. In the following cases, there may be something wrong with the pickup.

1. The tracking error signal amplitude is extremely small (less than 2 Vp-p).

2. The focus error signal amplitude is extremely small (less than 2.5 Vp-p).

3. The positive and negative amplitudes of the focus error signal are extremely asymmetrical (2 : 1 ratio or more).

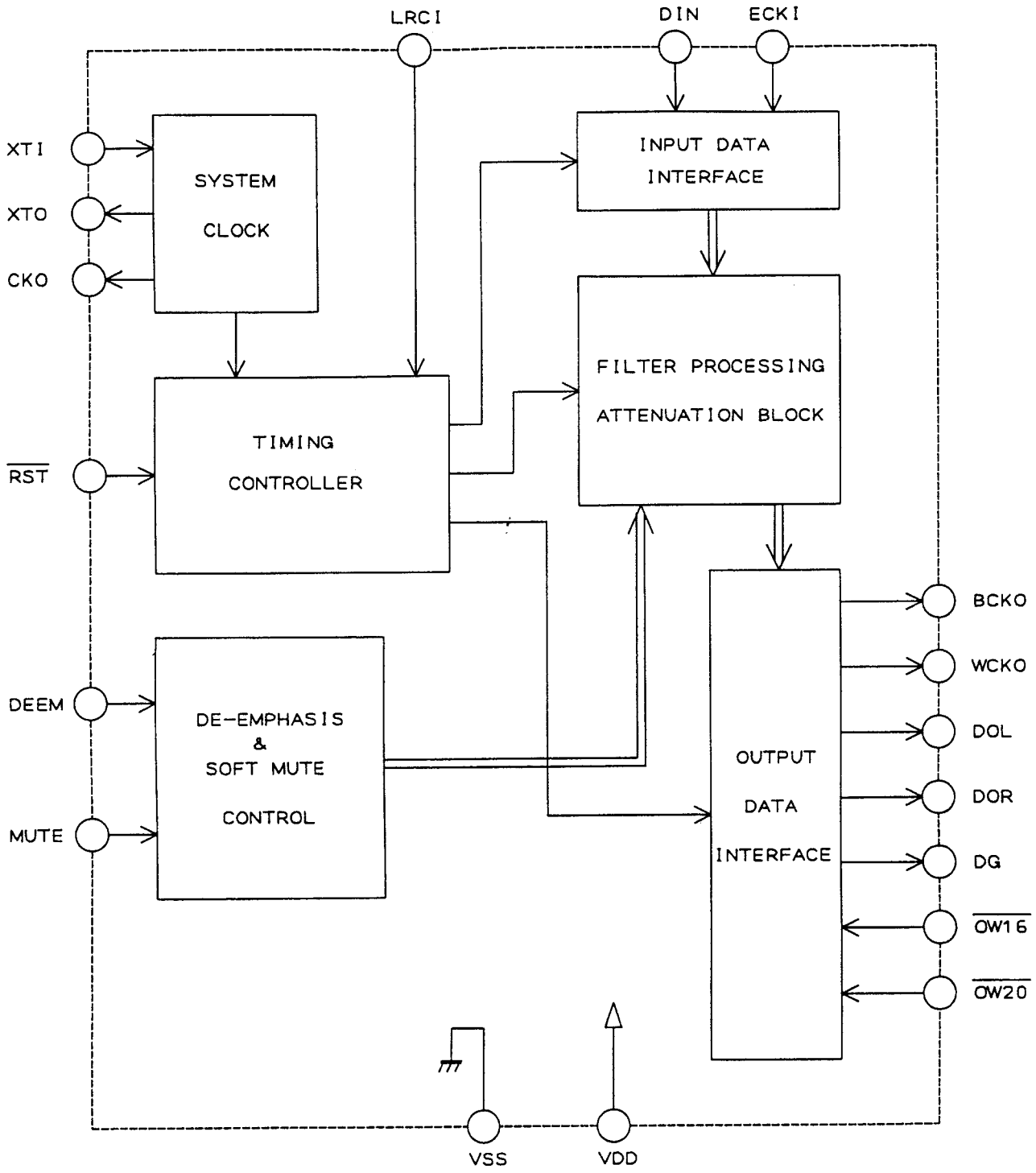
4. The RF signal is too small (less than 0.8 Vp-p) and even if VR 1 is adjusted (laser power), the RF signal can not be brought up to the standard level.

7. IC INFORMATION

■SM5840CP

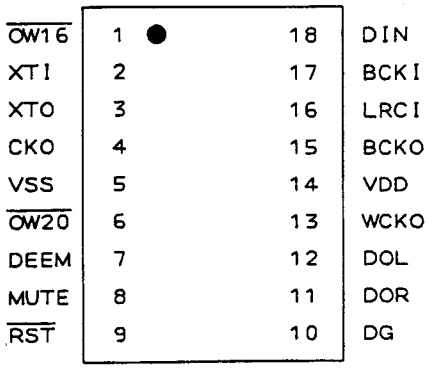
Digital Filter

- **Block Diagram**



• Pin Assignment

(TOP VIEW)



• Pin Function

No.	Pin name	I/O	Function
1	$\overline{OW16}$	I	Output bit rate select input 1. (*1)
2	XTI	I	Oscillator input.
3	XTO	O	Oscillator output.
4	CKO	O	Clock output. (Frequency is the same as XTI.)
5	V_{SS}	–	GND terminal.
6	$\overline{OW20}$	I	Output bit rate select input 2.(*1) Refer to $\overline{OW16}$.
7	DEEM	I	De-emphasis sygnal input. L : De-emphasis OFF, H : De-emphasis ON
8	MUTE	I	Mute signal input. L : Soft mute OFF, H : Soft mute ON
9	$\overline{RST}$	I	System reset signal input.(Initialize)
10	DG	O	De-glitch output.
11	DOR	O	Data output for R ch.
12	DOL	O	Data output for L ch.
13	WCKO	O	Word clock output.
14	V_{DD}	–	Power supply input(+5V)
15	BCKO	O	Bit clock output.
16	LRCI	I	Sampling rate(fs) clock input for input data.
17	BCKI	I	Bit clock input
18	DIN	I	Data input

*1 : Selection of output bit rate.

Settings		$\overline{OW20}$	
		H	L
$\overline{OW16}$	H	18bit output Noise shaper ON	20bit output Noise shaper ON
	L	16 bit output Noise shaper ON	16bit output Noise shaper OFF (test mode)

8. FOR PD-9700/KC, HEM, HB AND SD TYPES

8.1 CONTRAST OF MISCELLANEOUS PARTS

NOTES :

- *Parts without part number cannot be supplied.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*

The PD-9700/KC, HEM, HB and SD types are the same as the PD-41/KU type with the exception of the following sections.

Mark	Symbol & Description	Part No.					Remarks
		PD-41 /KU type	PD-9700 /KC type	PD-9700 /HEM type	PD-9700 /HB type	PD-9700 /SD type	
	FL sheet	PAM1514	PAM1514	PAM1251	PAM1251	PAM1514	
	33P F.F.C/30V	PDD1094	PDD1094	.....	.....	.....	
	31P F.F.C/30V	.....	.....	PDD1092	PDD1092	PDD1092	
	Cord with plug(mini plug)	PDE-319	PDE-319	.....	.....	.....	
	Front panel assembly	PEA1167	PEA1166	PEA1166	PEA1166	PEA1166	
	CD packing case	PHG1677	PHG1670	PHG1670	PHG1670	PHG1670	For packing
	Recycle label	PRW1253	PRW1253	.....	.....	.....	
⚠	AC power cord	PDG1015	PDG1015	PDG1003	PDG1036	PDG1013	
⚠	Strain relief	CM-22C	CM-22C	CM-22B	CM-22B	CM-22B	
⚠	Voltage selector	.....	.....	.....	.....	PSB1002	
⚠	Power transformer(8VA)	PTT1166	PTT1166	PTT1167	PTT1167	PTT1168	
⚠	Power transformer(15VA)	PTT1206	PTT1206	PTT1207	PTT1207	PTT1208	
⚠◉	MAIN BOARD assembly	PWZ2150	PWZ2150	PWZ2151	PWZ2153	PWZ2151	
⚠	PRIMARY BOARD assembly	Non supply	Non supply	Non supply	Non supply	Non supply	
⚠◉	ANALOG BOARD assembly	PWM1490	PWM1490	PWM1490	PWM1492	PWM1490	
◉	FUNCTION A BOARD assembly	PWZ2168	PWZ2168	PWZ2169	PWZ2169	PWZ2169	
	FUNCTION B BOARD assembly	Non supply	Non supply	Non supply	Non supply	Non supply	
	Operating instructions (German/Italian/Dutch/Swedish /Spanish/Portuguese)	.....	.....	PRF1048	.....	.....	

MAIN BOARD ASSEMBLY(PWZ2151 and PWZ2153)

The MAIN BOARD assemblies (PWZ2151 and PWZ2153) are the same as the MAIN BOARD assembly (PWZ2150) with the exception of the following sections.

Mark	Symbol & Description	Part No.			Remarks
		PWZ2150	PWZ2151	PWZ2153	
	D391-D394	1SS254	.....	.....	
	C391	CGCYX103K25	.....	.....	
	C392	CCCSL101J50	.....	.....	
	R391	RD1/6PM244J	.....	.....	
	R392	RD1/6PM102J	.....	.....	
	CN351	HLEM33S	HLEM31S	HLEM31S	
	JA391,JA392	RKN1004	.....	.....	

PRIMARY BOARD ASSEMBLY

The PRIMARY BOARD assemblies of PD-9700/KC, HEM, HB and SD are the same as the PRIMARY BOARD assembly of PD-41/KU for the service supply parts.

ANALOG BOARD ASSEMBLY(PWM1492)

The ANALOG BOARD assembly (PWM1492) is the same as the ANALOG BOARD assembly (PWM1490) with the exception of the following sections.

Mark	Symbol & Description	Part No.		Remarks
		PWM1490	PWM1492	
	L540-L547	PTH1010	.....	

FUNCTION A BOARD ASSEMBLY(PWZ2169)

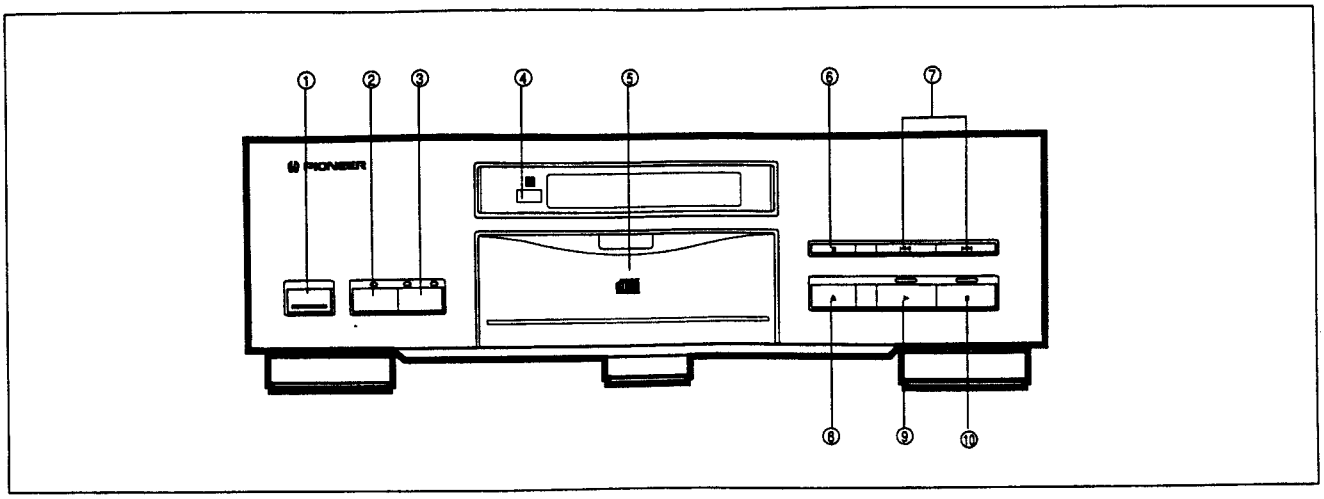
The FUNCTION A BOARD assembly (PWZ2169) is the same as the FUNCTION A BOARD assembly (PWZ2168) with the exception of the following sections.

Mark	Symbol & Description	Part No.		Remarks
		PWZ2168	PWZ2169	
	CN401	HLEM33R	HLEM31R	

FUNCTION B BOARD ASSEMBLY

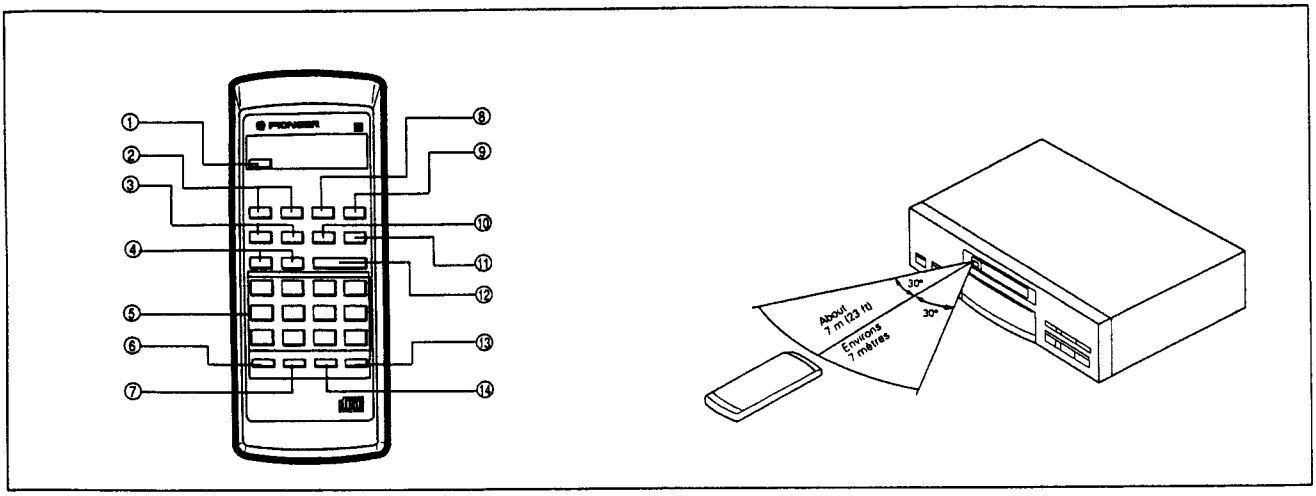
The FUNCTION B BOARD assemblies of PD-9700/KC, HEM, HB and SD are the same as the FUNCTION B BOARD assembly of PD-41/KU for the service supply parts.

9. PANEL FACILITIES



FRONT PANEL

① POWER switch
② DISPLAY button and OFF indicator
③ OUTPUT button and DIGITAL/ANALOG indicators
④ Remote sensor
Receives the signal from the remote control unit.
⑤ Disc tray
⑥ STOP button (■)
⑦ TRACK search buttons (|◄◄/►►|)
⑧ OPEN/CLOSE button (⏏)
⑨ PLAY button (►) and indicator
⑩ PAUSE button (II) and indicator



REMOTE CONTROL UNIT

Remote control buttons with the same names or marks as buttons on the front panel of the player control the same operations as the corresponding front panel buttons.

① OPEN/CLOSE button (⏏)
② INDEX buttons (← / →)
③ MANUAL search buttons (◀◀ / ▶▶)
④ TRACK search buttons (⏮ / ⏭)
⑤ Track number/Digit buttons (1-10, +10, ≧ 20)
⑥ PGM (Program) button
⑦ CHECK button
⑧ REPEAT button
⑨ RANDOM PLAY button
⑩ PAUSE button (⏸)
⑪ STOP button (■)
⑫ PLAY button (▶)
⑬ TIME button
⑭ CLEAR button

REMOTE CONTROL OPERATIONS

When operating the remote control unit, point the unit's infrared signal transmitter at the remote control receiver (REMOTE SENSOR) on the front panel of the player. The remote control unit can be used within a range of about 7 meters (23 feet) from the remote sensor, and within angles of up to about 30 degrees.

NOTE:

If the remote control sensor window is in a position where it receives strong light such as sunlight or fluorescent light, control may not be possible.

10. SPECIFICATIONS

1. General

Type ..... Compact disc digital audio system
Power requirements
European model ..... AC 220 - 230 V, 50/60 Hz
U.K. and Australian models ..... AC 230 - 240 V, 60 Hz
U.S. and Canadian models ..... AC 120 V, 60Hz
Other models ..... AC 110/120 - 127/220/240 V (Switchable), 50/60 Hz
Power consumption ..... 22 W
Operating temperature ..... +5°C - +35°C
+41°F - +95°F
Weight ..... 8.0 kg (17 lb, 10 oz)
External dimensions ..... 420(W) X 330(D) X 130(H) mm
16-9/16(W) X13(D) X 5-2/16(H) in

2. Audio section

Frequency response ..... 2 Hz - 20 kHz
S/N ratio ..... 111 dB or more (EIAJ)
Dynamic range ..... 98 dB or more (EIAJ)
Channel separation ..... 107 dB or more (EIAJ)
Harmonic distortion ..... 0.002% or less (EIAJ)
Output voltage 2.0V
Wow and flutter ..... Limit of measurement (±0.001% W.PEAK) or less (EIAJ)
Channels ..... 2-channel (stereo)

3. Output terminal

Unbalanced type audio line output jacks
Optical and coaxial digital output jacks
Control input/output jacks (U.S. and Canadian models only)
CD-DECK SYNCHRO jack

4. Functions

Basic operation buttons
- PLAY, PAUSE, STOP

Search function
- Direct play
- Track search
- Manual search
- Index search
- Time location

Programming
- Maximum 24 steps
- Pause
- Program check/correction
- Program clear (single track or all tracks)

Repeat functions
- 1 track repeat
- All tracks repeat
- Program play repeat
- Random play repeat
- Program random play repeat

Random play (repeat also available)

Switching display
Time consumed, remaining time (track/disc), and total time

Timer start

5. Accessories

- Remote control unit 1
- Size AAA/R03/dry batteries 2
- Control cord (U.S. and Canadian models only) 1
- Output cable 1
- Operating instructions 1

NOTE:
Specifications and design subject to possible modification without notice, due to improvements.